

PACIFIC PULP & PAPER •

INDUSTRY

DECEMBER
1935

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The Coos Bay Pulp Corporation's Unbleached Sulphite Pulp Mill
at Empire, Oregon



● The Chart Room in the mill of the Pulp Division, Weyerhaeuser Timber Company, at Longview, Washington, where all process variables are graphically recorded.



Uniformity

of physical and chemical characteristics

in the pulp made by the Pulp Division of the Weyerhaeuser Timber Company is accomplished by accurate control of the many variables in the manufacturing process. Cumulative graphic records of all vital details assist the pulp makers by furnishing direction to their efforts to constantly improve Weyerhaeuser pulp.

WEYERHAEUSER
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STANDARD

PULP DIVISION
WEYERHAEUSER TIMBER COMPANY
LONGVIEW, WASHINGTON

A feather

WOULD HAVE BEEN



Amazing discovery of 600 pounds difference in pressroll pressures is a stunning surprise. Uneven stock and high drying costs eliminated by Taylor Pressroll Load Recorder.

THIS TEST took place under actual operating conditions in a paper mill. The machine tender adjusted weights on the bottom fulcrum levers of the press section of the paper machine, according to his idea of where the weights should be and how much they should be.

It was supposed that his experience

would be sufficient to obtain the correct weight on each end of the pressroll. In this case the regular practice called for a 50-pound weight six inches from the end of the lower fulcrum lever on both ends of the press.

Then a Taylor Pressroll Load Recorder was hooked on to check the actual roll pressure. At one end of the roll 1900 pounds were recorded. At the other, the Recorder showed a pressure of 2500 pounds. A difference of 600 pounds. A feather would have knocked over the superintendent.

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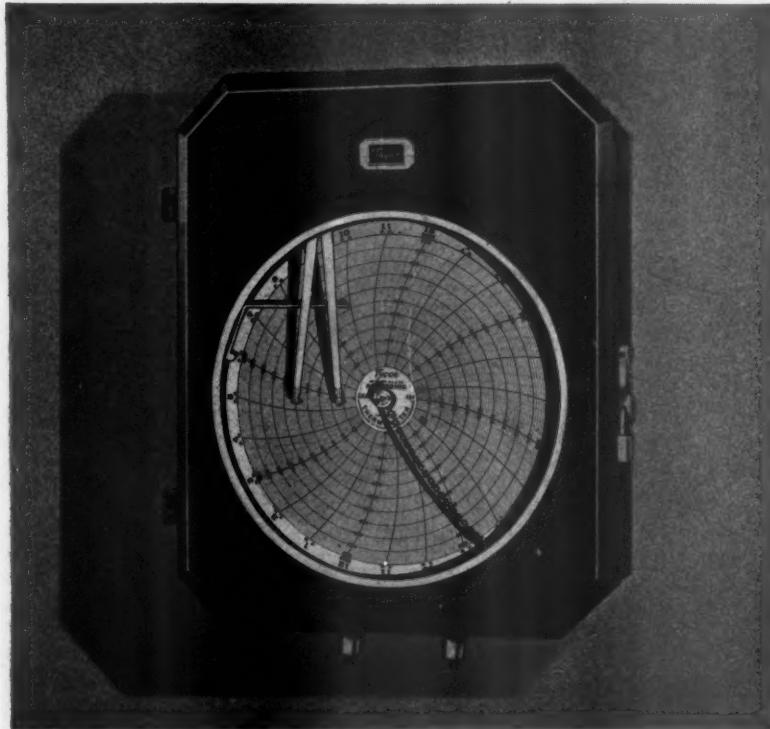
The Taylor Pressroll Recorder also determines the quality of the paper. It guards against an over- or under-dried edge and assures a uniformly dried sheet with the exact characteristics desired in the finish, bulk, density, opacity and other qualities that make up the specifications for each grade of stock.

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*Pacific Coast Representative—L. H. Wear,
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* * *

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THE PACIFIC COAST JOURNAL FOR PRODUCERS, CONVERTERS, AND DISTRIBUTORS OF PULP, PAPER AND BOARD

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Vol. 9

DECEMBER, 1935

No. 12

A STATE FOREST POLICY

Lumber and Pulp Industries Warned of Danger in Governmental Efforts to Control All Timber.

By T. S. GOODYEAR*

The next forward step in forestry is an immediate revised taxation system applicable to timber and forest lands. The present system compels an early liquidation of private timber holdings, which is disastrous to any permanent forest policy. The Pacific Coast is far removed from a market for lumber and its byproducts. Consequently, operators can hardly afford to transport logs from woods to the mill unless they cut out at least 50 percent merchantable lumber. The balance is wasted and left in the woods. There are comparatively few lumbermen operating on the Pacific Coast that have realized even a fair return on their timber investments—largely attributable to an unsteady and adverse market. Since a great percentage of our remaining timber is in private ownership and also the best timber producing lands are privately owned, it is rather hopeless to develop a sound forest policy until such time as there may be some inducements offered to private industries to operate their timber holdings upon a sustained yield basis. This can only be accomplished through a deferred or yield tax against timber and forest lands.

Public Ownership Not Solution

My personal opinion is that future forestry and timber problems cannot be entirely solved by extensive federal and state acquisition of cut-over and timber lands. Public ownership and administration of the natural resources will eventually aggravate rather than settle the present forest land problems. The most used argument for federal forest land acquisition at present seems to be a citation of the efficient management of government owned timber lands in the European countries. It must be remembered that the governments of most foreign lands were based not only upon governmental or crown ownership but also operation and management of the natural resources, while theoretically our government is supposed not only to encourage

but also to protect private ownership and enterprise. This government is very largely dependent upon development by private capital and enterprise of its natural resources and its strength is directly in proportion to the prosperity and development of industry. Rather than a concentrated program to take away from private ownership the forest lands in this state, it is my suggestion that governmental agencies, as well as state and local, combine their efforts to encourage the retention and development of forest resources by individual capital and effort, thereby assuring a permanent source of revenue for support of the various necessary, regulatory governmental departments.

Does Government Plan to Enter Lumber Business?

A tree planting program for a treeless region extending from Texas to the Canadian boundary is now under way and also a federal land acquisition program for forestry purposes to the extent of 224,000,000 acres. With such a large percentage of forests federally owned and controlled, is it not the next logical step for government to enter the business of logging, sawmilling and, possibly, merchandising lumber? In 1931 the total Forest Service expenditures for all purposes were \$35,877,808.00—in 1934, \$75,984,699.00. Gentlemen, this is indeed an ambitious program. Let us pause a moment for an historic parallel. Mark Anthony in his oration upon the death of Julius Caesar said: "The noble Brutus hath told you Caesar was ambitious; if it were so, it was a grievous fault and grievously hath Caesar answered it." Let us profit from the experience of the illustrious Caesar and proceed cautiously; establish a practical permanent forest policy and not a temporary one, conceived and developed by ambition for power and expansion so easily acquired in times of economic stress and strife. Public control of the state's greatest natural resource, its greatest revenue producing industry from the standpoint of wages and taxation, may end grievously for all concerned.

Governmental Timber Management Inefficient

Timber lands owned and administered by public agencies—either government or state—are not managed as efficiently or economically as by individual or corporate effort. I firmly believe that forest lands in private ownership, with some encouragement from public agencies along the lines of equitable taxation, may become self-supporting and return a fair profit to the owner, while it is questionable whether either national or state forests may ever be operated upon a self-supporting basis. For example, when, if ever, will grazing fees and the sales of timber from the national forests return the government an annual income of \$75,000,000.00? Of these huge sums allotted for land acquisition, timber production and conservation, how much is spent by the government or state to make private forestry pay? Plenty of sympathy and free advice, printed bulletins with theoretical information about logging and operating sawmills, some encouragement for fire protection through Clarke-McNary contributions, but no tax relief and little material help toward solving the complex problems of marketing timber and its byproducts. We therefore suggest a deferred or yield timber tax and recommend reduction in valuation of lands classified under the Reforestation Act from \$1.00 to \$.50 an acre on lands west of the Cascade Mountains and from \$.50 to \$.25 for lands east of the Cascade Mountains as the first important step necessary to encourage the practice of forestry upon private timber holdings and the retention of forest lands in private ownership.

Existing grazing laws make ample provision for handling trespass of sheep on state owned lands. However there is no provision relating to grazing of cattle. We have, for example, on the one block of some 42,000 acres of cut-over land recently purchased by the State Forest Board, a situation that involves an absolute trespass of some 600 or 800 head of cattle grazing the entire year. The streams have been polluted to such an

*Supervisor of Forestry, State of Washington. Presented before the Washington State Forestry Conference, November 22, 1935, at Seattle.

extent that Army authorities have ordered abandonment of our CCC side camps that has been developing a forest nursery, numerous roads, trails and other improvement work on the state forest. The little mill town of Bordeaux, that has a population of some 500 or 600 people, obtains its water supply from this area. Medical authorities have advised it is no longer safe to use the present water supply until suitable barriers are constructed around the streams to protect them from cattle. In the Ahtanum Creek area of Yakima County the state owns approximately 2½ or 3 townships of pine lands that have always been an excellent grazing area. However, during the past several years this has been over-grazed to the extent that the grasses have been nearly destroyed and serious erosion has begun. Unless there is some legislation enacted whereby cattle grazing may be regulated, this particular unit will be entirely destroyed as a grazing area and thereby seriously affect the cattle industry in that locality. Under existing legislation the state is powerless to regulate grazing. In order properly to administer and regulate grazing on the extensive areas of state owned land and to provide for collection of grazing fees, the following legislation is herewith proposed:

Section 1. It shall be unlawful in this state for cattle to enter any land or lands, enclosed or unenclosed, belonging to or in the possession of any person other than the owner of such cattle, unless by the consent of the owner of said land, other than the public lands owned and administered by United States government.

Section 2. That any person, being the owner or having in his possession, charge, or control, as herder, or otherwise, any cattle, who shall herd or drive such cattle upon the lands of another for the purpose of pasture, against the consent of the owner of such lands, shall be deemed guilty of a misdemeanor.

The objection by the last legislature to this bill was the erroneous idea that it was an attempt to interfere with the cattle industry. On the contrary, it is only a regulatory measure to prolong and strengthen this industry.

Urge Christmas Tree Tax

In order to regulate to some extent and reduce the enormous waste connected with the Christmas tree industry, we take this opportunity to reiterate the necessity and advantage of imposing a severance tax of 1c per tree for all evergreen trees commonly known as Christmas trees, including fir, hemlock, spruce and pine trees, transported to a point outside the state of Washington; also a similar tax of ½c per pound on greens used for decoration and ornamental purposes, such as huckleberry branches and ferns—the director of licenses to issue, distribute and collect for the necessary tags and seals. Present laws provide for a collection of \$1.00 per tree by the landowner for either willful or unintentional trespass. It is suggested that willful trespass and the cutting of Christmas trees without consent of the landowner be made a misdemeanor, punishable by a minimum fine of at least \$25.00.

Should Establish Uniform Standard of Value

It is further recommended that the various governmental agencies and state departments that have the authority for purchasing forest lands establish a uniform or standard value for lands, by

districts, in order to eliminate competitive bidding in the land purchase programs.

The state forestry department has already established a nursery with a capacity for growing 6,000,000 seedlings or transplants a year. The next legislature should provide an annual appropriation of \$5,000.00 for maintenance and development of this nursery.

State Should Maintain CCC Improvements

Up to the present time the CCC organization, operating upon state and private lands under direction of the state forestry division, has constructed approximately 1,000 miles of truck trail, 200 miles of horse and foot trail, 300 vehicle bridges, 325 miles of telephone line, completed road and trail side clearing on some 350 miles, felled snags on 18,882 acres, built 4 ranger stations, 8 lookout towers, and completed about 20 miles of fire break. With probability that the CCC organization will be eliminated or greatly reduced by the fiscal year of 1936, the state must begin to consider the problem of maintaining these improvements. It is therefore proposed that a request be made to the legislature for the sum of \$20,000.00 per year for maintenance of these projects.

Fire Protection

Section 5785, Remington's Revised Statutes, Laws of 1921, provides: "The salaries and necessary expenses of all wardens, together with all wages and expenses incurred for help and assistance in forest fire protection, shall be fixed by the said director, the wages and salaries to be based on but not to exceed going wages and salaries for similar work, and shall be borne in the proportion of two-thirds by the state and one-third by the county in which the service was given and the expense incurred for forest fire protection." This is a most unjust provision and it is very difficult to make a fair distribution of the state appropriations for fire protection to the various counties, for the reason the greatest fire risks exist in a good many of the counties that are the poorest financially and can ill afford to pay back to the state general fund their part of the necessary expenditures for adequate fire protection. We suggest this law be amended and replaced by a substitute provision, whereby the state department of forestry may collect directly from the counties an assessment, similar to forest patrol assessment levied against private owners, for the protection of county owned lands.

From recent trips, in which I travelled through most of the timbered states in the lake regions, the south and New England, I observed only two states—New York and Pennsylvania—that were any further advanced in forestry legislation or systems of fire protection than the State of Washington. I believe we have our fire situation fairly well in hand as demonstrated by the fact that last summer which, according to the Weather Bureau, was one of the longest and driest summers that has occurred in the past 45 years, there were reported on some 12,000,000 acres of state and privately owned lands, some 1,892 fires on which the total loss and damage was but \$87,476. Therefore, it seems at this time there is no necessity for either new or revised legislation in connection with forest fire protection.

In fairness to the other members of the State Forest Board who do not entirely agree with me, particularly in the matter of public land acquisition, my remarks on that subject should not be considered as an official expression by the board.

FIBREBOARD BUYS STETTLER BOX PLANT

Fibreboard Products, Incorporated, with headquarters in San Francisco and mills in Los Angeles, Stockton, Antioch, California, and at Sumner and Port Angeles, Washington, purchased on December 3rd, the pioneer Portland box making concern, the F. C. Stettler Manufacturing Company.

T. Noel Bland, secretary-treasurer and assistant general manager of Fibreboard negotiated the deal which it was announced involved the buying of all plant equipment and real estate of the Stettler firm for \$310,000 cash. Immediate possession was taken. The price of the real estate was \$85,000 approximately and that of the corporate assets \$225,000.

J. B. Martin, resident manager of the Fibreboard mill at Port Angeles will be manager of the Stettler Fiberboard plant.

The purchase of the Stettler plant brings the total number of mills and conversion plants operated by Fibreboard in Washington, Oregon, California and in Philadelphia to fourteen.

Fibreboard Products is the largest producer of boxboard in the West and is said to be the third largest in the country.

SOUNDVIEW TO APPLY FOR STOCK LISTING

The Soundview Pulp Company of Everett, Washington, plans to apply to the San Francisco Stock Exchange for listing of the company's stock. There were but 4,185 shares of \$10 par capital stock outstanding December 31st, 1934, according to the company's statement.

Sales of the Soundview mill for the first ten months of 1935 totalled 51,692 tons. In the last ten months of 1934 sales were 42,490 tons.

H. H. Fair, president of Soundview, states it is the policy of the company to improve the quality of its product and to strive to establish a reputation in the pulp trade for a quality of pulp as uniform and high as that produced by any other mill in the paper pulp trade. To this end, and as well with a view toward lowering the cost of manufacture, \$76,997 was expended for plant betterment during the last ten months of 1934. Mr. Fair stated that the program of improvement is still in progress.

ORGANIZE PULP UNION AT COOS BAY

Late in November a local of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers was organized at Empire, Oregon, among the men employed by the Coos Bay Pulp Corporation.

Application has been made for a charter from the International union.

Temporary officers elected were: Wade Carter, president; Ed McSkimmins, vice president; Roy Perrin, recording and corresponding secretary; Harry Ward, financial secretary and treasurer; T. Thomas, inside guard; Louis King, outside guard; H. A. Sullivan, D. Y. Steen and Charles Bushman, trustees.

Permanent officers will be elected in February.

RAINIER LABORATORY NEARS COMPLETION

The research laboratory under construction at Shelton, Washington, by the Rainier Pulp & Paper Company is rapidly nearing the final stages with the painting under way and some of the equipment being installed.

FEDERAL RESPONSIBILITIES IN CONNECTION WITH THE PRESENT FORESTRY PROGRAM

By CLYDE S. MARTIN*

This is a broad subject.

In general, to administer National Forests, Indian Forests, and forested land on the Public Domain in such a manner that they will best serve the public interest by securing the wisest use for the lands under government control, and provide an example of good forest management for private owners.

After all, industry with its employees represents a goodly portion of the public interest; it pays a large part of the taxes from which government activities are financed; nor can forestry function without a stable and prosperous industry to utilize and distribute forest products.

Are Federal Agencies Fulfilling Obligations?

So we have ample justification for asking whether our federal agencies are fulfilling their responsibilities to the public of which we are a part.

Should public money be spent seeking to fasten the economic ills of this northwest country almost entirely on its largest industry? Should catch phrases such as "timber famine," "devastation," "timber mining" and "cut and get out" be continually dinned into the public ear by government press agencies without recognition of the economic causes of present conditions? Have our federal agencies given us an example of efficient, economical forest management? Have there been any management plans worked out for government forests which show that a forest, capitalized on present stumpage values and held over an entire rotation, will produce an adequate financial return on the capital investment necessary? Are government management practices such as would encourage private owners to follow them?

We are told that the practice of sustained yield forest management on pri-

*Forest Engineer, Western Pine Assn., Portland, Oregon. Presented before the Washington State Forestry Conference, at Seattle, November 22, 1935.

RAINIER DRILLS ANOTHER TEST WELL

The middle of November the Rainier Pulp & Paper Company of Shelton completed another test well this time to a depth of 793 feet. It is reported that one or more permanent wells will be drilled in the vicinity of the test well, which showed a good flow of water.

FOREST SERVICE PLANTING TREES

The U. S. Forest Service will have planted by the end of 1935 approximately 222 millions trees on 244,000 acres in national forests, thereby tripling the planting of 1934.

However, very little of this tree planting was done on the Pacific Coast, the total being 2,330,000 trees divided by states as follows: Washington, 2,900 acres upon which was planted 1,800,000 trees; Oregon, 980,000 trees on 1,500 acres; California, 550,000 trees on 1,100 acres.

ate lands requires only the will to do so and a proper sense of public and moral responsibility, that the greed of the industry is the only real obstacle to accomplishing a forest utopia overnight. Is government really meeting its own responsibilities in these matters?

Is the Indian Service helping by declaring for subsidized competition with private industry? Has the Interior Department contributed to the public welfare by keeping in line with the standards of forest practice required of private industry? Does it meet its share of protection costs and see that its forest lands are kept productive? Has it as a department of the federal government contributed to sustained yield?

In October, 1933, and again in January, 1934, there met in Washington, D. C., the most representative group of leaders in the lumber and timber products industries and of the various public agencies ever assembled in this country.

They agreed jointly to advocate and further in every way possible a program looking toward the wisest possible use of the forest resources of the country.

Let us examine these recommendations and see just what the federal agencies, backed by a Congress that passed over 90 per cent of the legislation demanded of it by the administration and provided with almost unlimited funds for public expenditures, have accomplished.

Now let us turn to the federal responsibilities listed in the Washington State Planning Council report. (See pages 17 to 24 of January, 1935, Pacific Pulp and Paper Industry.)

Clarke-McNary Law

With millions being thrown away, not even authorized expenditures appropriated.

McSweeney-McNary Law

Research and products work restricted when it was most needed. Whole pro-

gram endangered through lack of dependable continuing appropriations.

Fulmer Act

Will operate to place State Forestry under control and dictation of Forest Service.

Forest Credits

So involved with immediate sustained yield that few can use them. Element of federal control of operations so strong that management could only use it as last resort.

Washington

During a period when fire hazard due to the public was constantly increasing—1925-1932—federal expenditures for protection decreased by \$205,240 while the cost to private owners increased by \$746,461.

This does not indicate that federal responsibilities in protection were being fulfilled.

During the two years, 1933-1934, in this state 62 per cent of all fires were caused by incendiaries, smokers and campers. If we add those caused by other sources, over which the lumberman and timber owner had no control, the percentage increases to 86 per cent. In other words, the industry is responsible for 14 per cent of the fires, is given 90 per cent of the blame, and pays over 75 per cent of the cost of protection and suppression.

In summing up, I would say that if the expenditure of government funds to arouse public feeling against a great industry and convince the public that the only solution of economic problems is to accept blindly the plans drawn up by government agencies, that the federal responsibilities have been more than fulfilled. But that if any part of such responsibilities have to do with carrying out a mutually agreed upon program to advance forest conservation, that there is much to be desired in the accomplishment to date.

VARLEY UP NORTH

John Varley, superintendent for the Paraffine Companies, recently visited the mills at West Linn, Camas, Port Angeles and Port Townsend while on a business trip to Oregon and Washington.

JAPANESE MILLS TO MAKE RAYON PULP

Commercial Attaché Julean Arnold of Shanghai late in November radioed the Department of Commerce that four Japanese companies had been granted permission to engage in the manufacture of bleached sulphite pulp suitable for rayon. The total yearly output of the four companies he estimated at 60,000 tons. No details were furnished in his report.

MOULDED PULP BOTTLES

In France olive oil is being sold in a moulded pulp bottle, enamel lined to prevent penetration of the oil.

MEEHAN PROPOSES to BUILD PULP MILL IN BRITISH COLUMBIA

Plans for the construction of a 500-ton pulp and paper mill near Vancouver, B.C., by Wisconsin and New York interests, were outlined to Pacific Pulp & Paper Industry by William Meehan, of J.P. Meehan & Company, Vancouver timber and construction engineers, who have for several months been negotiating for power facilities in the Cheakamus River district north of Squamish.

Mr. Meehan says that their present negotiations with the Vancouver city council are tied up with rights to the Cheakamus watershed, but that if these do not reach a satisfactory conclusion within a reasonable length of time, the interests whom he represents are ready to proceed with building of a mill at some other location.

Mr. Meehan returned a few days ago from Vancouver Island, where he inspected several alternative power sites. He and his engineers explored the possibilities of Campbell River, where British Columbia Power Corporation now holds hydro rights and has spent some \$100,000 on preliminary development, and Nimpkish River, where International Harvester planned to finance a pulp mill some five or six years ago. Mr. Meehan was particularly favorably impressed with the Nimpkish, but for various reasons a site on the mainland of British Columbia is regarded as preferable. The company wishes to avoid, if possible, the necessity of creating a townsite. It would sooner have the mill located near an existing city, preferably Vancouver.

"Our firm represents timber holders who have for a good many years held upwards of five billion feet of timber in various parts of British Columbia, chiefly pulpwood," said Mr. Meehan. "A large proportion of that timber has reached maturity and should be cut. The timber holders have been paying taxes so long that they are naturally anxious to get some return on their investment, and establishment of a pulp mill seems the logical step for them. We are interested primarily in the manufacture of rayon pulp, although other grades of pulp and perhaps newsprint might be produced as well."

Although not closely identified with the pulp and paper industry in British Columbia in the past, the Meehans have been associated with timber all their lives. They were born in Wisconsin and their father was a lumberman there. They came to the Pacific Northwest more than a quarter century ago and for a while lived in Portland before going on up to Vancouver, where they have made their home since 1911. They have figured in timber deals, logging, bridge construction and similar activity in Washington and British Columbia over such a long period that they are familiar with the practical side of timber and pulpwood production.

Until the beginning of the year the project will mark time because until then the Meehans will be unable to get a definite assurance one way or another from Vancouver city authorities regarding Cheakamus power. A special meeting with a committee of the council has been fixed for an early date, but with Mayor McGeer and some of the most influential members of the council in the east it is

unlikely that the meeting will get much past the preliminary stage.

Although the city does now own the Cheakamus site, which is about twenty miles north of Squamish, Howe Sound, close to the Pacific Great Eastern Railway, the city does not include the area in the general jurisdiction of the Greater Vancouver Water Board and it would have to be consulted before the power there is harnessed for commercial purposes. The Meehans want to use between 40,000 and 50,000 horsepower.

The city has been jealous of its interests in Cheakamus because a faction of the council has for some years been playing with the idea of a municipally owned public utilities system. At present the powerful British Columbia Power Corporation holds a monopoly of all the light, power and street car facilities in Vancouver and throughout the lower mainland of the province. The city has the power in its franchise with the B.C. Power Corporation to take over the company's holdings in the downtown Vancouver area, and if it decided to do this the Meehans have offered the proposition that they would co-operate in production of power at Cheakamus for the use of the city. The Meehans, at one point in the negotiations, even offered to find the funds to take over the whole public utility system.

The issue is therefore involved for the present in whether or not the city is serious in its designs on municipal control of utilities. The popular feeling in Vancouver is that the city will stay out of the power business, in which event it might feel disposed to leave the road open for the Meehans to go ahead with independent development of Cheakamus and the establishment of transmission lines from a power plant there to the proposed mill near Vancouver. If, on the other hand, the city decides to block independent development at Cheakamus, the Meehans will go ahead with one of the other sites. Mr. Meehan stated that the interests he represents were anxious to get construction under way as soon as possible in the new year.

Mr. Meehan is inclined to oppose Squamish as a site because it lacks suitable foundation. Squamish is the southern terminus of the Pacific Great Eastern Railway, which runs through a considerable section of pulp timber, but it has only water connection to Vancouver and other cities.

EXPECT EARLY SETTLEMENT OF CANADIAN-JAPANESE TRADE PROBLEM

Termination of the trade war between Canada and Japan which since midsummer has halted export of pulp from British Columbia to Japanese buyers is now in sight, and a settlement of the difficulties will probably be reached within a month.

Since the Mackenzie King government took office a more moderate view has prevailed at Ottawa concerning the Japanese trade situation, and the dispute was among the first issues to be tackled by the new administration. Advice from Tokio indicated that officials there were inclined

to show a friendlier spirit towards Canada and that if a new agreement could be reached whereby Tokio could "save face" all would be well. As in other controversies in which Japan has been involved, the Japanese were unwilling to back down from their stand without gaining some concessions.

Japan made three objections to Canada's trade conditions when it brought down its prohibitory 50 percent surtax on pulp, lumber and various other Canadian products. First of all, Japan protested against Canada's arbitrary valuation of Japanese goods for customs purposes. The Canadian government has agreed to remove this, so that point is settled. Second, there was opposition to Canada's dumping duties being made applicable to anything of "a class or kind made in Canada."

Both the arbitrary valuation and the dumping duty matter were cleared up automatically by the signing of the new trade agreement between Canada and the United States since what was done with regard to all other countries on those two particular points applied to Japan.

The third objection by Tokio was the Canadian valuation of the Japanese yen for customs purposes. The par value of the yen is 49.85 cents. The Bennett government offered to value it at 41.50 cents and to have an adjustment every six months. This point is still at issue, and it remains to be seen whether the Japanese authorities will consent to the proposed valuation in view of the currency having depreciated to around 29 cents.

Japanese trade was one of the major considerations during the federal election campaign in Canada. Ex-Premier Bennett, who refused to negotiate with Japan when the latter country first criticised the Canadian tariff, maintained that Japan's low cost production made her goods unfair competitors with Canadian industry and that any concession made to Japan would be at the expense of business in Canada. Premier Bennett was prepared to call Japan's bluff, but discovered that Japan was serious. Even then Bennett refused to relent, and during the campaign Mackenzie King criticised the Bennett attitude as unnecessary restriction of trade. Immediately after election Mackenzie King gave spectacular demonstration of his conviction that Canada's tariff barriers should be lowered when he signed the reciprocal treaty with the United States, and announced that steps would be taken at once to end the trade war with Japan.

B. C. Pulp & Paper Company and Pacific Mills, Ltd., will profit most from resumption of pulp exports to Japan. Both these companies had extensive business in Japan, which was completely suspended when the surtaxes were clamped down last July.

HAMMERMILL MEN ON COAST

Ernest R. Behrend, president of the Hammmill Paper Co., led a group of his firm's executives on a Pacific Coast tour in November that included a visit to their mill at Hoquiam, Wash., and attendance at the annual colorful "big game" between the Stanford and California football varsities at Palo Alto.

In the group were Norman W. Wilson, vice president and general manager; Donald S. Leslie, assistant general manager, and W. T. Brust, assistant treasurer. They were accompanied by W. S. Lucey, general manager of the Grays Harbor mill.

All of the visitors are from Erie, Pa.

COOS BAY PRODUCING HIGH GRADE UNBLEACHED SULPHITE FROM SITKA SPRUCE

When, on the morning of August 15th, the whistle of the Coos Bay Pulp Corporation's mill at Empire, Oregon, signalled the starting of operations, the sound was a most welcome one to the residents of the Coos Bay cities—Marshfield, North Bend and Empire. It meant steady employment for about 250 men at the mill and additional work for many men in the woods.

For three years and two months the former Sitka Spruce Pulp and Paper Company mill had not turned a wheel. During the intervening years the plant had become so entangled in litigation that many people in Coos Bay despaired of its ever operating again.

But that was before they became acquainted with the fighting qualities of Mr. K. O. Fosse, president of the Coos Bay Pulp Corporation. About a year and a half after the pulp mill shut down, Mr. Fosse, who has had years of experience in logging, sawmilling and pulp and paper manufacturing, decided the Sitka Spruce mill could be operated successfully under efficient management. Although the legal barbed wire surrounding the mill property was formidable, Mr. Fosse set about to cut his way through to complete control of the plant.

After purchasing the mill property from the trustees selected by the creditors of the Sitka Spruce Company, he was

faced with court tests of the legality of the sale. Nearly a year and a half elapsed before the Supreme Court of Oregon established Mr. Fosse's legal title to the mill.

Finally, on March 4, 1935, the battle was won, and the Coos Bay Pulp Corporation was formed with Mr. Fosse as president. The new organization took possession immediately and set in motion previously laid plans for a thorough rebuilding of the mill.

In rehabilitating the mill, all changes and improvements were shaped toward achieving the idea Mr. Fosse had in mind from the beginning of his fight to purchase the plant; namely, to produce quality unbleached sulphite pulp from the famous Sitka spruce which grows in abundance along the coast of Oregon.

Today the idea is becoming a reality. Every 24 hours 60 tons of quality unbleached sulphite pulp, made from Sitka spruce, is baled for shipment by rail or water.

Practically a New Mill

The plant has been so completely redesigned and rebuilt that it is almost a new pulp mill. In his desire to produce quality unbleached sulphite pulp, Mr. Fosse is laying emphasis upon the use of good wood, careful wood cleaning, care in acid making and filtering, screening, water purity, the use of wood pipe

for stock lines, and cooking methods which will produce good pulp.

The Work of Rebuilding

The original sawmill with a capacity of 125,000 board feet per eight hour shift has been improved in operating efficiency. It is equipped with a single cut band mill.

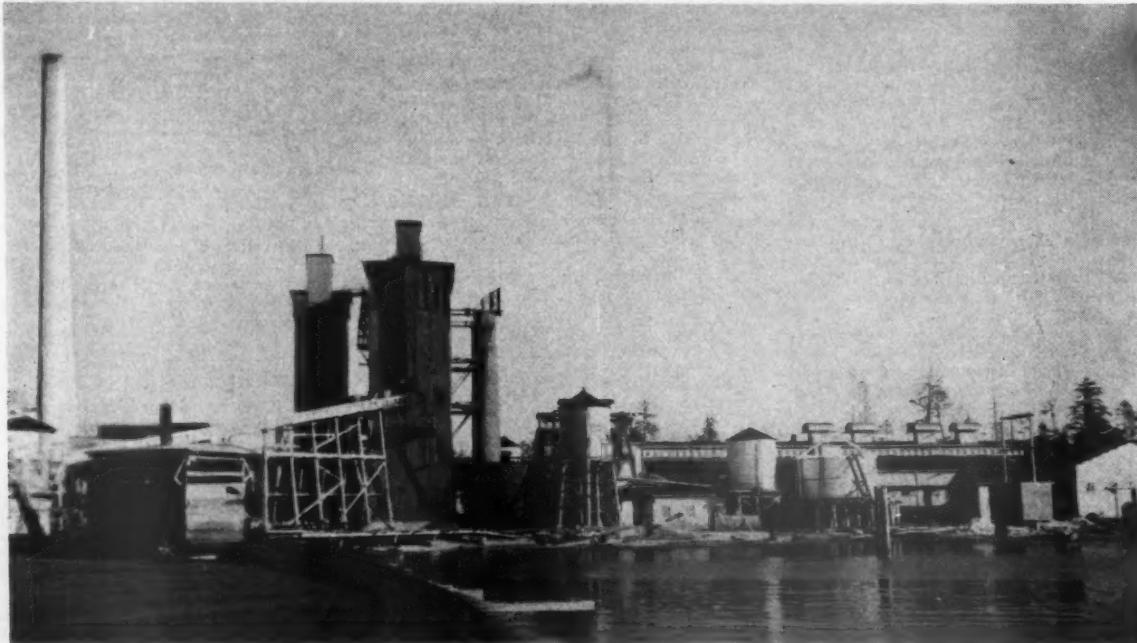
The Coos Bay Logging Company operates the sawmill one shift per day under lease, cutting Douglas fir into lumber which they market themselves. All refuse is conveyed to the pulp mill power plant to produce steam.

A second shift is operated entirely on Sitka spruce by the pulp company. Large, sound spruce logs are cut into cants eight by ten inches or smaller and cut by a slasher into four foot lengths.

Wood Thoroughly Cleaned

Before going into the chipper the cants are thoroughly washed on the conveyor to remove all bark, sawdust and dirt. Only clean wood reaches the chipper. Exceptional care is exercised in cleaning all wood that goes into chips.

Slabs suitable for pulp are selected by expert wood room men and put through a Gruber automatic barker which quickly removes the bark. Difficult pieces are carefully hand barked on motor driven concave head barkers.



A recent view of the Coos Bay pulp mill taken from the west, or bay side, showing, left to right, the new stack, the acid towers, digester building, the machine room and pulp storage building.

PACIFIC PULP & PAPER INDUSTRY

7

After chipping the chips are put through a large capacity shaker screen and then conveyed to the chip storage bins at the top of the digester building. These bins have storage capacity for five cooks.

All wood refuse is hogged and conveyed either to the boilers or to the hogged fuel storage.

The design and equipment of the wood room reflects Mr. Fosse's experience in building and operating the chipping plants of the International Wood and Sulphite Company.

Improving the Steam Supply

When the mill was first built the boiler house contained but one 300 horsepower boiler. Three have been added, bringing the total horsepower to 1200. A new 175-foot concrete stack was built to add to the efficiency.

Water cooled grates have been installed to facilitate heating the boiler feed water and to prevent clogging of the grates by the hogged fuel.

The boiler feed water, after chemical treatment, passes through the grates where it is heated to 150 degrees Fahrenheit, before flowing into the boiler tubes.

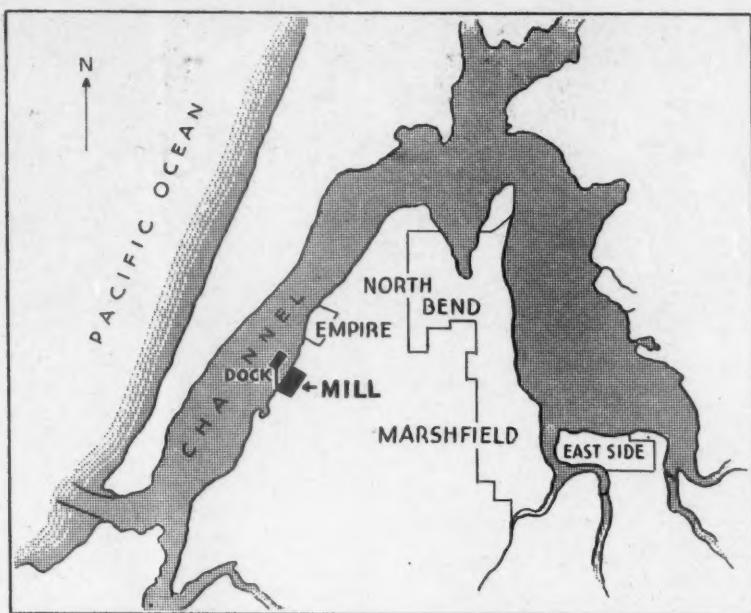
Steam is produced at 175 pounds and is slightly superheated so it will remain dry when it reaches the farthest sections of the pulp mill.

Electric power is furnished by the Mountain States Power Company. None is generated at the mill.

Improved Acid Plant and Digester Control

New relief gas coolers were installed and the Janssen gas cooler capacity was increased by 50 percent.

The two digesters, each 16 by 52 feet, will produce between 60 and 70 tons of pulp per day. The original Stebbins linings were found to be in good condition



and so were not touched. All the small bronze digester fittings have been replaced by stainless steel. Digester operations are all recorded. Recording thermometers, pressure gauges and flow meters were installed to enable the operators to keep an accurate check on the cooking process.

Change Blow Pits

The entire blow pit system was rearranged and the wooden bottoms replaced with stainless steel purchased from Ray Smythe of Portland. The vomit stacks were rebuilt and strengthened.

Cam action on the nineteen flat screens

was revamped. Each screen has twelve plates. All new plates were installed.

Build Own Decker

A 96-inch double decker equipped with stainless steel fittings and Huntington rubber rolls, was patterned after Rainier Pulp & Paper Company's design and built at the mill by Mr. Sigurd Norman, superintendent.

New pumps were purchased to handle acid, stock and white water.

Rebuild Machine Wet End

Under the direction of Mr. Norman the wet end of the pulp drying machine was rebuilt. The presses were rearranged and the vats revamped.



Superintendent Norman talking things over with the machine crew at the finishing end of the pulp dryer.

PACIFIC PULP & PAPER INDUSTRY



The Gruber Automatic Barker helps Coos Bay obtain clean pulp by removing all bark from slabs.



The 96-inch double decker with stainless steel fittings and rubber rolls, built by Sigurd Norman, Superintendent.

The pulp drying machine is a Black-Clawson with 42 dryers and trims 96 inches. The wet end consists of two cylinder molds, three presses and two suction boxes.

As there is no pit under the machine it has been set five above the floor. The arrangement gives plenty of clear space beneath the dryers.

The machine is driven by a 100-horsepower General Electric steam turbine running 1200 r.p.m., and operating at 150 pounds pressure. Exhaust steam is used for drying.

Dryer drainage was improved through changes in the system. Condensate is now rapidly removed and returned to the boilers.

Closed Water System

Mr. Norman has developed closed water systems which materially reduce the amount of fresh water consumed. The water removed by the cylinder molds is mixed with 2 percent stock to the proper dilution by a fan pump, the overflow being employed to dilute the stock in the double decker. Water removed by the decker is used to dilute the stock going to the knotter.

By this method the water consumption is not only reduced but the temperature of the water in the vats can be controlled by the injection of steam.

Use of warmer water increases the freedom of the stock, enabling the suction boxes and presses to remove more water and to pass a drier sheet of pulp to the dryer section. Case hardening of the pulp sheet is thereby prevented.

Water Consumption

Through the use of the closed system the daily water consumption is reduced

to approximately 2,000,000 gallons. This is filtered through a sand filter and is chemically treated to remove harmful bacteria.

Wood Pipe and Chests

There is no opportunity for Coos Bay pulp to pick up dirt from iron during the manufacturing processes as it passes through nothing but wood pipe and is blended and stored in wooden chests.

New Construction

In addition to the stack the new construction embraces the wood room and a pulp storage building as well as an addition to the dock. The dock extends farther into the channel connecting Coos Bay with the Pacific Ocean. Two lumber carriers transport the baled pulp from the storage building to ships loading at the dock. An electric truck stacks and handles the pulp in the warehouse.

A Well Equipped Laboratory

A laboratory equipped with all necessary apparatus has been set up under the direction of Quentin Peniston, chemist. Mr. Peniston came from the Rainier Pulp & Paper Company laboratories, where he spent several years in pulp mill control work.

Through the laboratory every step in the process of producing high grade unbleached sulphite pulp is tested and checked daily to maintain uniformity, high color and low dirt count.

Experienced Personnel

In organizing his operating group, Mr. Fosse selected experienced men. Mr. Sigurd Norman, the superintendent, is a sulphite operator of many years experience.

He is a graduate of the University of Oslo, Norway, with degrees in chemical and mechanical engineering. Before coming to North America Mr. Norman was superintendent of the Lillestroms Celulosefabrik and manager of the Katfos Celulosefabrik. From the Katfos mill Mr. Norman came to the United States to do pulp mill consulting work, later joining the Laurentide Company during a period of sulphite mill construction. From there Mr. Norman went with the Canadian International Paper Company at Hawkesbury, Ontario, as assistant to Mr. C. B. Thorne, vice-president and general manager. After three years with International he returned to Katfos as manager. Three years later Mr. Norman went to Brazil as technical director of a paper mill, built and owned by Norwegians. In 1923 he returned to the United States, becoming sulphite superintendent for the Munising Paper Company, and later assistant mill manager.

In 1927 he came to the Pacific Coast to take charge of the Spaulding Pulp & Paper Company's mill at Newberg, Oregon, where he remained until 1930, when Mr. Norman joined the Sumner Iron Works of Everett, Washington, to design and sell pulp mill equipment.

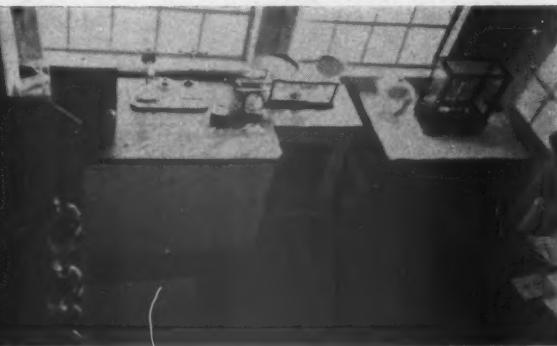
On May 1st, 1935, he became superintendent for the Coos Bay Pulp Corporation at Empire, Oregon.

Mr. Edward S. Morton, who has been with the Rainier Pulp & Paper Company at Shelton, Washington, since operations started in 1927, left in May of this year to become assistant to Mr. Fosse.

Mr. Wiley Smith, accountant for the company, came from the Puget Sound Pulp & Timber Company's mill at Anacortes, Washington.



A well equipped laboratory helps Coos Bay maintain uniform, high quality pulp.





COOS BAY OPERATORS

In the center, K. O. Fosse, President of the Coos Bay Pulp Corporation. At his left, Sigurd Norman, Superintendent. At the right, Edward S. Morton, Assistant to Mr. Fosse.

KILLIN SUCCEEDS SHIRLEY

A. P. "Bert" Killin, formerly superintendent of the paper machine rooms at Powell River, has been appointed assistant superintendent of Powell River Company, succeeding the late Cliff Shirley, who died recently after a long illness.

Mr. Shirley had been with the Powell River organization since 1921, having previously been with the old Whalen Pulp & Paper Company at Port Alice, later taken over by B. C. Pulp & Paper Company. He was sulphite superintendent at first and was named assistant general superintendent about two years ago.

A. P. Killin is succeeded in the machine department by F. R. Riley, and Riley's former post is taken over by Walter Snyder, one of the Powell River veterans.

Allan Watson, acting sulphite superintendent for some time, has been appointed sulphite superintendent.

NEWSPRINT

A. E. McMaster, vice president and general manager of Powell River Company, recently returned from a three weeks' eastern trip during which he conferred with several newsprint executives and made a general survey of the paper situation.

Mr. McMaster noted a more optimistic feeling than he has encountered in months, and seems satisfied that conditions have definitely passed the turning point. Newsprint consumption is increasing all down the line and the coming year should witness continued improvement, he says.

"The one dollar a ton increase in basic price is the first advance in a long while and while it is quite inadequate, it at least indicates that the trend is upward at last," says Mr. McMaster.

The Powell River executive said that there had been no formal discussion of the price situation on the Pacific Coast yet, but that coast mills would probably follow the leadership of eastern mills and advance the basic price a dollar a ton.

Finding business definitely better throughout the territory in which he

travelled, Mr. William Barclay, sales manager of Powell River Company, returned to Vancouver head office a few days ago from a month's swing around the southern states to the Atlantic Coast and back. Mr. Barclay visited several publishers in the Texas area, where Powell River has many customers.

CANADIAN NEWSPRINT SITUATION CLEARING

Uncertainty has prevailed over the Canadian newsprint industry as a result of the negotiations between Great Lakes Paper Company and the Newsprint Export Manufacturers Association which, it was feared for a while, might result in a breakdown of the tentative agreement among the mills to fix a basic price for newsprint one dollar in advance of last year's figure, namely, \$41.

As receiver for Great Lakes Paper Company, the National Trust Company tendered its resignation from Nemac (Newsprint Export Manufacturers Association). This was done so as not to place the receivership in the position of contributing to expenses of Nemac opposition to court sale of the Great Lakes assets.

An open price war was feared because National Trust Company, not being a member of Nemac, would not feel pledged to the \$41 price and would possibly undersell so as to arrange for disposal of its total tonnage. Early in December advices from the east indicated that National Trust was being held in line and that immediate peril of price break no longer existed. What caused the first unsettled was the announcement by National Trust, acting for Great Lakes, that it would pursue an independent sales policy. This announcement was made in the letter of resignation from Nemac.

Meanwhile efforts are being made to complete reorganization of Great Lakes Paper Company, and the plans will be submitted to the Ontario supreme court this month. The sale of assets as approved by bondholders involves contracts with American publishers to purchase most of the company's output for ten

years. This is known as the Gefaell-Aldrich plan, the originator being John E. Gefaell, who has been busy signing up publishers in the middle west in the hope that he can account for the required 67,000 tons before the offer can go before the court. There is considerable opposition to this plan from some of the bondholders and from the industry at large. The right of contracting publishers to receive dividends from Great Lakes was one of the reasons for opposition from other companies, the contention being that such an arrangement would act as a contingent rebate to disturb the newsprint price structure for years. In addition, the Ontario government opposes the reorganization on that basis. If the plan is rejected by the court, will National Trust, as receiver for Great Lakes, feel obliged to sacrifice its own interests to maintain the \$41 price or will it, pursuing an independent sales policy, go out after orders at \$40—a move that would undoubtedly assure the Great Lakes mill of sufficient tonnage to run the 100,000 ton mill to capacity?

The \$41 base price, established when Great Northern Paper Company entered into contracts at that rate in October, was not regarded as adequate by the industry as a whole, but was accepted with the consolation that it was, at least, an advance over the 1934 figure. To upset this meagre increase would be a sad blow indeed to the industry.

ENGLISH NEWSPRINT MAN VISITS COAST

A visitor to British Columbia newsprint mills this month was W. Neville Berry, representing Edward Lloyd, Ltd., British newsprint manufacturers and operators of what is claimed to be the biggest paper machine in the world, at Sittingbourne, Kent., an all-British Walmsley that turns out paper 320 inches wide.

Mr. Berry visited more than twenty eastern Canadian mills and was the guest of Powell River Company on a trip to Powell River. After spending a few days in Vancouver, B. C., he went to Seattle, where he took a plane for Los Angeles. He visited no mills in the western states.

"Just seeing how you do things out here," was Mr. Berry's explanation for his four-months' tour. "The chief difference between our mills in England and most of the Canadian newsprint plants is the fact that we do far more super-calendaring. Our costs are greater and we cannot meet Canadian prices in the lower grades. Our only chance to win is by continually improving quality of the product."

Mr. Berry says the most serious competitor in the British market is Finland. His own mill draws most of its raw material from the Baltic provinces—pulp from Norway and Sweden in winter, and logs from Russia in the summer months.

"One thing this country has that we lack is waterpower," said Mr. Berry. "We have to generate all our own power. However, I doubt whether that is so very much more costly. Labor, transportation and spruce pulp and logs are the items that make it impossible for us to meet Canadian prices which in England are about \$5 a ton less than our own. Incidentally, we don't think that competition is entirely fair."

Pacific Northwest logging methods were a revelation to Mr. Berry, who drove out to the Green Point Logging Company operations at Harrison Lake. "There's nothing in Europe remotely like it," he said.

V. D. SIMONS PREPARING ESTIMATES FOR TASMANIA MILL

The Derwent Valley Paper Company of Tasmania, Australia, has established an office in San Francisco and has arranged with Mr. V. D. Simons, consulting engineer of Chicago, to set up the necessary organization in this office to carry out the preliminary work on cost estimation in relation to the proposed Tasmania industry.

Mr. Simons has been engaged on this work in collaboration with Mr. L. R. Benjamin, the company's chief technical officer, since October last and expects to finish the preliminary examinations and estimates by Christmas.

This work is being correlated to an in-

vestigation of logging proposals which Mr. Paul E. Freydig is making in the Derwent Valley Company's Seattle office, following his visit to the company's timber concessions last year. Mr. Freydig is leaving for a short visit to Australia on December 10th and will submit final proposals for logging on his return to Seattle in March next.

In January, after Mr. Simons' report has been received, Mr. Benjamin will go East, where he will join Mr. Thorold Fink, chairman of the company, and sail with him to England and the Scandinavian countries to study the equipment situation.



THOROLD FINK
Chairman of the Board
Derwent Valley Paper Company, Ltd.
of Tasmania



L. R. BENJAMIN
Technical Director
Derwent Valley Paper Company, Ltd.
of Tasmania

CORRUGATED BOARD LIKE PLYWOOD

David Weber & Company of Philadelphia, makers of corrugated shipping cases is offering the "Weber Cross-Ply Corrugated Board."

The board is made on the same principle as plywood and is said to be stronger because of the layers of corrugated board being at right angles to each other. The heavy liner is also said to be cross grained, adding further strength.

B. C. PLANS FOREST RESEARCH

The British Columbia government is planning to go ahead with an extensive program of research into wood utilization next year in co-operation with the staff of the University of British Columbia which has already conducted valuable laboratory work in connection with pulp and newsprint processes.

Experiments will be made chiefly in connection with the manufacture of various forms of paper board for which many B. C. woods are believed to be suitable.

Financing of this research will be provided at the next session of the legisla-

ture, according to Hon. Wells Gray, minister of lands.

Chief handicap in wood utilization at present lies in marketing. B. C. could, for instance, produce large quantities of turpentine but a sales outlet is lacking. A more ready market for paper board and other construction material is anticipated.

HELLER & MERZ ISSUE NEW BOOKLET

Heller & Merz, manufacturers of dyestuffs, have just issued a new edition of their "Dyestuff Data for Paper Makers," a copy of which may be obtained by addressing Bill Marshall, Pacific Coast Supply Company, Pittock Block, Portland, Oregon.

The booklet contains full information on all types of dyestuffs and the conditions under which they work to the best advantage. Tables show PHs under which the different types of dyes are most efficient. Other tables show fastness to alkalies, acids and chlorine.

The section on calendar staining includes a drawing showing the best machine hookup.

SCHAFER BROTHERS RETAIN RIGHT TO LOG SATSOP TIMBER

The Schafer Brothers Logging Company of Montesano and Aberdeen have secured a verbal extension of two years on their contract with the United States Forest Service to log 852,000,000 feet of timber in the Upper Satsop and Wynoochee valleys.

The Forest Service granted the extension, which is soon to be placed in contract form, because it realized that due to the depressed conditions of the past few years it had not been possible for Schafer Brothers to log the area in accord with their original contract.

Puget Sound loggers were attempting to obtain the logging rights. However, now that Schafer Brothers have an extension the logs will be brought to Grays Harbor. There is much hemlock in this large block of timber.

CHROMIUM CORPORATION DEVELOPS NEW SCREEN PLATE

The Chromium Corporation of America, whose representative on the Pacific Coast is Charles H. Belvin of Portland, recently introduced its new development, "Open Back" screen plates.

In the "Open Back" design every other projection on the back is removed. This, the Chromium Corporation states, offers two definite advantages, first, the widening of the back slots permits easier stock release and consequently less possibility of clogging; second, it allows improved coverage of the Chromium Corporations CRODON plate within the slots, where adequate protection is most essential.

Strength of the plate is maintained by the heavy plate of chromium. Patents are pending on this "Open Back" design.

LINK-BELT INTRODUCE SELF-ALIGNING ROLLER BEARING UNITS

The Link-Belt Company recently introduced a line of Link-Belt Shafer Self-Aligning Roller Bearing Mountings for industrial application.

The advantages claimed for the new bearing and mounting combination are: to carry radial loads, thrust loads and radial and thrust loads combined; and also inherent self-alignment.

The new bearings are available for pillow blocks, ange bearings, hangers and take-ups.

BLOCKING THE WHEELS OF PROGRESS

Action by the Connecticut State Milk Administrator recently brought about the discontinuance of the use of paper milk bottles by The Great Atlantic & Pacific Tea Company in Waterbury and vicinity.

It was reported that the administrator's objections to the paper milk bottles were based on his explanation that the paper bottle cost the consumer nothing while the glass bottle necessitated a deposit of five cents. The alternative for the glass packers was either to give the glass bottle away or lower prices, thus "disturbing the situation." He also claimed the paper bottle would lower prices to the milk producers.

The proprietor of the one dairy supplying A&P with milk in paper containers stated that his withdrawal was not permanent and that when the paper bottles came back they would be used universally. He stated that a survey of milk users indicated that only one in thirty objected to the paper container.

SEMI-PLANT PULP LABORATORIES INCLUDED IN NEW UNIVERSITY of WASHINGTON CHEMISTRY BUILDING

By KENNETH A. KOBE

Department of Chemical Engineering,
University of Washington

A \$2,262,000 building program is now under way at the University of Washington. The most important part of this program is \$1,040,000 for a new chemistry and pharmacy building to replace the present structure built in 1909 for the Alaska - Yukon - Pacific Exposition. A PWA grant of \$353,000 was made for the new chemistry building.

The building is situated west of Frosh Pond and will complete the science buildings of Johnson, Physics, and Guggenheim Halls. The architecture of the building will be a modified Tudor-Gothic style, being less ornate in design than the other new buildings in the science quadrangle. The building will cover an area of almost one acre, being shaped like an H. Total floor space in the building is over three acres and the cubical contents of the building is nearly 2,500,000 cubic feet. The basement floor will contain the chemical engineering laboratories, industrial chemistry laboratories, physical chemistry laboratories, about 15 individual research laboratories, and the main stockroom. The first floor contains the administrative offices of chemistry and pharmacy, physiological chemistry, quantitative chemistry, the upper part of the chemical engineering laboratory, the library, and the main lecture hall seating 300. The second floor contains organic and inorganic chemistry, small lecture and recitation rooms, and a social or recreation room. The third floor houses the pharmacy laboratories. This floor is not complete, being like a T turned on the side, as the rear wings are left off. A fan room constitutes a very small fourth floor.

It is believed that the name "Bagley

Hall" will be transferred to the new building.

Work on the new building will start very shortly as the contract for excavation is to be let December 15th. Under the terms of the PWA grant, the building is to be completed within one year.

Chemical Engineering

The chemical engineering laboratory is 78 x 39 feet and is two stories in height with a balcony at the first floor level. In the basement are also a machine shop, 19 x 12 feet, small research laboratory, and storage room for supplies. A large laboratory, 27 x 30 feet, for the hydrogenation equipment and chemical engineering research opens from the chemical engineering laboratory. The crushing and grinding equipment is given a separate room, 17 x 10 feet, so that dust and dirt may be confined. A lavatory with showers fills a long felt want among the students working in these laboratories. At the first floor level a balcony leaves a center opening 15 x 43 feet, so that 30 feet of head room is available for distilling columns and other high equipment. The balcony has sectional flooring which may be taken up to permit equipment to pass through. Overhead is a 5-ton traveling crane which can work through the floor at any point. Two spiral stairways connect the basement level with the balcony. Professor Beuschlein's office opens off the balcony. Noteworthy features of the laboratories are the 12-inch gutter running the entire length of the basement laboratory and sufficient floor pitch to give proper drain off; keyhole strips every 3 feet to which equipment can be

fastened, special service lines giving high and low pressure steam, gas, compressed air, 300 ampere-220 volt lines; chimney flues through to the roof and an ice machine in a room next to the laboratory so that refrigeration may be supplied to equipment.

Industrial Chemistry

The laboratory for industrial chemistry consists of a series of rooms. The main laboratory is 47 x 39 feet and will contain desks for 72 students, though one more bench may be added in future expansion. A short corridor connects this laboratory with the balance room, 12 x 12 feet, and the gas and fuel laboratory, 32 x 12 feet, where calorimeters and special equipment will be used. Professor Kobe's office opens into the laboratory. A large laboratory, 32 x 41 feet, for industrial research contains desks for 60 students engaged in senior and graduate research. Electrochemical developments in the state warrant the addition of a laboratory 32 x 24 feet, where special or research work may be carried out in this field.

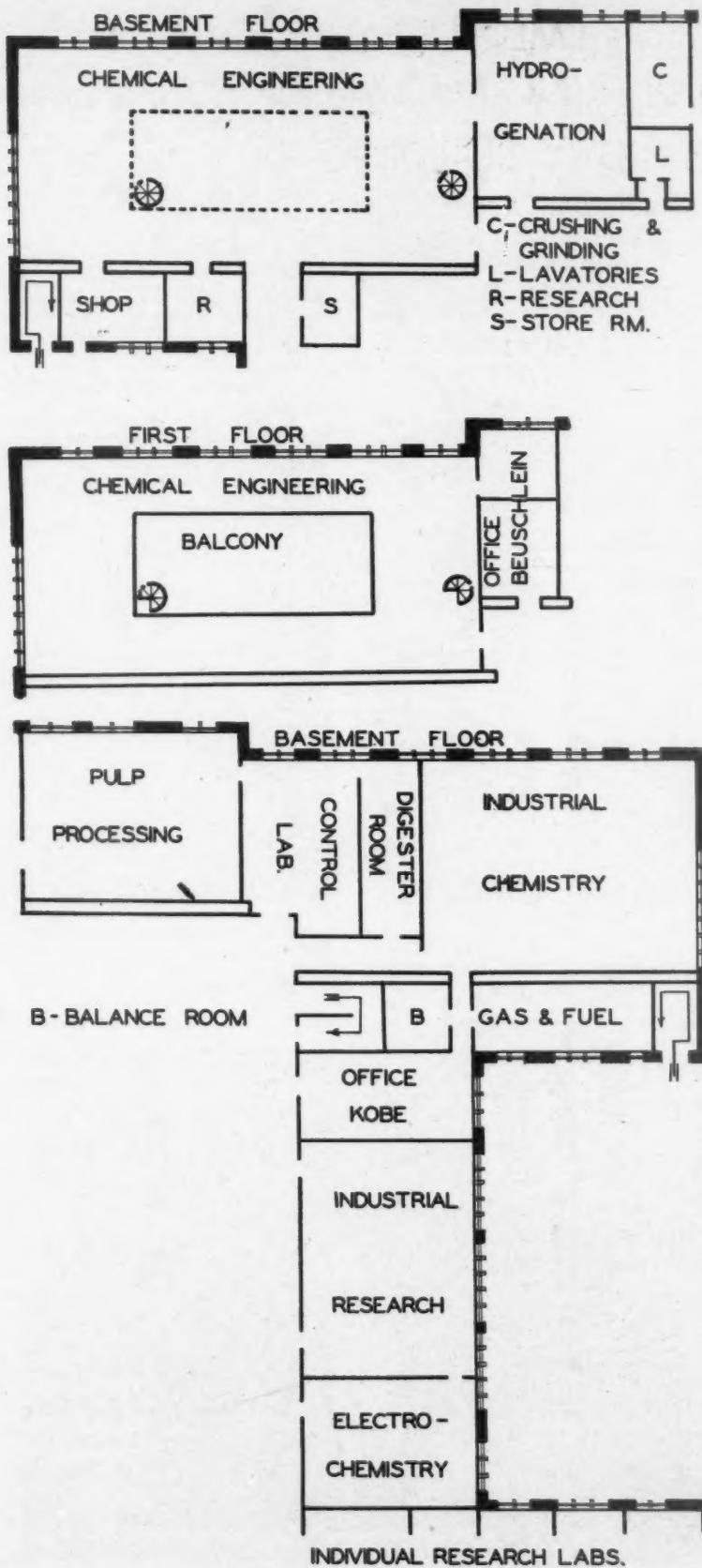
Professor Benson has a suite of rooms on the first floor, where all administrative offices are placed. A public office, private office and research laboratory constitute his series of rooms.

Pulp and Paper Laboratories

The great importance of the pulp and paper industry in the Northwest and the need for adequate training of the numerous graduates entering this industry have prompted the addition of a series of laboratories specially equipped for class and research work in this field. A small room, 11 x 33 feet, will be the digester



PACIFIC PULP & PAPER INDUSTRY



room, containing digesters and washers. A gutter runs the length of the room so that the waste can be washed into the sewer. A sump provides a catch basin for larger material washed away. A special flue leads from this room to the roof so that relief gases can be completely removed. A pulp processing laboratory, 38 x 30 feet, will contain equipment for the processing of the pulp prepared in the digester room. Beaters, bleaching equipment, sheet machines, driers, etc., will be installed here. The chemical control work necessary in both laboratories will be carried out in the control laboratory, 21 x 33 feet, situated between the other two laboratories. A glass partition separates the control laboratory from the other rooms, so that equipment can be seen but fumes are excluded. Special features of these rooms are the gutters in the digester and processing laboratories, large service lines similar to the chemical engineering laboratory; inner doors connecting all three rooms; keyhole standards for fastening equipment to walls.

A constant temperature and humidity room is available in the basement for paper tests.

Other Building Features

A number of other features of the building are for common use of the departments and will meet long felt wants. About 15 individual research rooms are in the basement and will be occupied by graduate students in physical chemistry and chemical engineering. Additional research rooms are part of each division on other floors. Dark rooms and constant temperature rooms are available when required by the special type of work.

The main stockroom and storage will be in the central part of the basement. Larger storage facilities will permit the carrying of larger stocks of technical chemicals. An instrument storage room will place a stockman in charge of all instruments and special apparatus previously handled by the various departments. An instrument shop will provide repair and construction of new research apparatus. A glassblower's shop permits repair and construction of glass apparatus.

The chemistry library has a room 61 x 30 feet next to Professor Beuschlein's office. Chemistry books and periodicals will be removed from the main library and kept here under the supervision of a librarian.

Building Equipment Not Complete

In order to construct a building of sufficient size to house all departments and allow for future expansion, and to meet PWA requirements for cost, most equipment items other than building service items had to be eliminated at the present time. It appears that some of the laboratories must be left bare, but suitable for recitation rooms, until additional funds are available.

Although desk equipment will be placed in all industrial laboratories, no new equipment can be purchased to expand the work being done. This would seriously handicap the expansion in pulp and paper work were it not for the WPA allowing a project for the design and construction of equipment for these laboratories. Mr. John Semding is at present designing pilot plant equipment for use in the pulp laboratories.

The pulp and paper laboratories will be, to start with, well equipped for fundamental work. Special equipment for research work will be added from time to time.

The WPA is not furnishing money for equipment, only for the engineer to do

the designing work on the laboratory equipment.

The most modern and progressive pulp and paper industry exists here in the Pacific Northwest and the industry has developed new equipment and processes not described in the technical literature. It is hoped that the industry will cooperate to the fullest extent to aid us in equipping our laboratories so that our students—your future employees—will have a first hand knowledge of the industry into which they will go upon graduation.

TECHNICAL DIRECTOR VISITS COAST

Joseph Schulein, technical director of the Chrome Plating Company of Milwaukee and Portland arrived on the Pacific Coast November 27th to devote six weeks calling upon mill operators in Washington, Oregon and California in company with Roy Sette, works and sales manager of the company's Portland plant.

Mr. Schulein, a graduate chemical engineer from the University of Wisconsin, has had eight years experience in handling industrial chromium plating. As chief chemist for the Barber-Colman Company of Rockford, Illinois, he installed a complete plating plant for them, and later for the National Lock Company of the same city.

His visit to the Coast in addition to the purpose of becoming acquainted with pulp and paper mill operators, is also for the purpose of enlarging the production facilities of the Chrome Plating Company's plant in Portland, so that larger industrial equipment may be handled with efficiency in the applying of quality chromium plating.

PIONEER-FLINTKOTE NEWS

A. E. Carlson, manager of the boxboard division of the Pioneer-Flintkote Co., Los Angeles, spent Thanksgiving week-end with Mrs. Carlson at Palm Springs, famed desert resort. "All the lure of the desert was there," said Mr. Carlson, who is a desert enthusiast. "Palm Springs was filled with lovers of the beautiful sunrises and sunsets for which this desert spot is famous, and I for one enjoyed every minute of it."

The Pioneer-Flintkote Co. has increased the storage capacity of the new boxboard warehouse by the purchase of an electric lift truck with which they now pile the board in double tiers. The usual skids are used, with the addition of pine platforms between the tiers to protect the board.

J. A. Waters, formerly a member of Waters & McLeod advertising agency, has joined the Pioneer Flintkote organization in Los Angeles as advertising manager.

PHILLIPS OF PIONEER-FLINTKOTE

Glen Phillips, assistant superintendent in charge of boxboard operations for the Pioneer-Flintkote Co. at Los Angeles, is the proud father of a new baby girl, Carol Ann Phillips. He recently held an exhibition at the plant, with Miss Phillips as the chief and only attraction. Several attempts at kidnaping were made, and Arthur E. Carlson, boxboard division manager, got as far as the corner with the young lady but was apprehended.

The staff is now planning to buy Glen Phillips a new and larger hat, and is also trying to stir up competition by urging their superintendent, J. D. Beatty—who has half a dozen or so already—to get in the running again.

HEMLOCK LOG SURPLUS RUNNING HIGH in Grays Harbor

The percentage of hemlock logs of all logs in the water in Grays Harbor continues to run high despite the lowered production due to the mill workers and boom men's strike during the summer and fall.

On November 1st, 1935, hemlock reached 35.8 percent of all logs in the water, the highest hemlock percentage ever recorded.

Despite the leaving of approximately 50 percent of all hemlock standing in the woods the surplus of hemlock continues to remain a serious problem for loggers in the Grays Harbor area.

The amount of hemlock brought in with other species used for lumber continues to exceed the quantity that can profitably be turned into hemlock lumber.

GRAYS HARBOR HEMLOCK LOG INVENTORY

Logs in Water on Dates Below

Year	Hemlock	Total Logs	% Hemlock
January 1st, 1931	2,790,000	80,590,000	3.5%
January 1st, 1932	8,125,000	66,485,000	12.2%
January 1st, 1933	11,025,000	34,530,000	31.9%
January 1st, 1934	13,800,000	84,925,000	16.3%
January 1st, 1935	20,000,000	67,618,000	29.6%
1934 Monthly			
January 1st	13,800,000	84,925,000	16.2%
February 1st	9,815,000	68,200,000	14.4%
March 1st	9,100,000	62,360,000	14.6%
April 1st	13,240,000	75,135,000	17.6%
May 1st	17,325,000	89,520,000	19.4%
June 1st	19,125,000	95,540,000	20 %
July 1st	20,395,000	108,215,000	18.8%
August 1st	23,285,000	118,628,000	19.6%
September 1st	20,710,000	85,535,000	24.2%
October 1st	22,910,000	71,740,000	31.9%
November 1st	24,727,000	75,921,000	32.5%
December 1st	20,390,000	69,038,000	29.5%
1935 Monthly			
January 1st	20,000,000	67,618,000	29.6%
February 1st	17,718,000	46,692,000	37.9%
March 1st	14,205,000	52,720,000	26.9%
April 1st	16,135,000	64,384,000	25 %
May 1st	20,706,000	75,641,000	27.4%
June 1st	17,787,000	77,550,000	22.9%
July 1st	18,035,000	80,270,000	21.3%
August 1st	16,254,000	73,527,000	22.1%
September 1st	13,040,000	62,725,000	20.7%
October 1st	13,050,000	44,805,000	29 %
November 1st	13,373,000	37,285,000	35.8%
December 1st	9,550,000	36,795,000	25.9%



SNAPPED AT PORT ALICE

A group standing in front of the machine room of the Port Alice, B.C., mill of the British Columbia Pulp & Paper Company were recently caught by Brian Shear's camera.

Left to right they are: C. C. Ryan, plant engineer; Andreas Christensen, assistant to president Lawrence Killam; A. F. Richter, president of the Stebbins Engineering & Mfg. Co., of Watertown, New York; Bruce Watson, foreman of the digester room; A. S. Quinn, Pacific Coast manager of Stebbins Engineering; Brian Shear, assistant superintendent of the Pennsylvania Salt Mfg. Co., of Washington at Tacoma; L. K. Bickel, chief chemist at Port Alice, and Mr. McGee, plant comptroller.

SUPERINTENDENTS DISCUSS OPERATING PROBLEMS

The highlight of the meeting held by the Pacific Coast Division of the American Pulp & Paper Mill Superintendent's Association at the New Washington Hotel in Seattle, December 6th and 7th, was the successful Saturday afternoon round table discussion.

Questions concerning operating problems, submitted in advance of the meeting, were brought up for discussion by James G. Ramsey, superintendent of the Everett Pulp & Paper Company, and a former president of the national superintendent's association, and by George W. Brown, superintendent of the Inland Empire Paper Company.

The two men stimulated discussion from the floor by giving ideas on each problem from their own wealth of experience. Many responded offering constructive solutions to the problems presented.

When the discussion ended the opinion was unanimous that this was the best discussion meeting held so far by the Pacific Coast Division.

Friday evening, December 6th, over a hundred members and their wives attended an informal get-together party arranged by General Convention Chairman A. S. Quinn, who provided dance music, entertainment and a buffet supper.

The Papers

Saturday morning Ferdinand Schmitz, Jr., chairman of the Pacific Coast Division, opened the meeting and called first upon Mr. L. C. Haffner, chemical engineer.

Mr. Haffner presented his paper on "The Electrodialysis of Pulp and Wood." He summed up his recent experiments in the pulping of wood by this method and explained the equipment employed through blackboard sketches. His paper will appear in the January issue of PACIFIC PULP & PAPER INDUSTRY.

Mr. Robert L. Stevens of The Instrument Company offered a paper on a new instrument, the Moisture Register. One of the registers was on exhibition and Mr. Stevens, upon concluding his paper, showed the superintendents how it instantaneously registered the moisture content of a sheet of pulp. Mr. Stevens was asked if the humidity of the room where the testing was done affected the test and he replied that humidity had no effect whatever on the instrument's operation. He also stated that the thickness of the pulp sheet did not affect the test in any way. Mr. Stevens' paper appears in full in this issue.

Dr. Robert E. Brown of the Rainier Pulp & Paper Company's staff presented moving pictures showing the making of rayon from wood pulp by the viscose method. The pictures were intensely interesting to the group and were exceptionally clear in their presentation of the various steps involved in the manufacture of rayon yarn.

Upon concluding the showing of the pictures Dr. Brown spoke briefly about the uses of wood cellulose. Samples of rayon yarn and rayon cloth were passed around for examination.

Chairman Schmitz asked for the report of the secretary-treasurer, H. A. Des Marais. Mr. Des Marais reported the financial condition of the Pacific Coast Division as being sound and expressed appreciation for the excellent financial condition to H. R. Heuer, who as the first chairman, handled the finances when the Pacific Coast division was organized. He also reported that the membership of the Pacific Coast Division is steadily gaining.

A nominating committee consisting of Niles Anderson, Art Zimmerman and Steve Viger was appointed by Chairman Schmitz with instructions to report in

the afternoon with nominations for officers for the 1935-1936 year.

Saturday Afternoon

Dr. H. K. Benson, of the Department of Chemistry, University of Washington, described the new chemistry building to be built shortly at the University of Washington, and showed blueprints of the laboratories which will be devoted to problems of the pulp and paper industry. Dr. Benson said that the construction contracts will be let December 15th and the building will be completed within a year. Elsewhere in this issue the details of the new building are presented.

Mr. George Seybold of the Chemical Construction Company of New York City, described his company's spray type sulphur burner and listed its advantages over the old type commonly used by the sulphite industry. The superintendents showed much interest in the spray type burner and Mr. Seybold answered a number of questions concerning its operation and construction.

Mr. Seybold has just completed installation of his company's spray type burner in the new unbleached sulphite pulp mill of the Weyerhaeuser Timber Company, Pulp Division, at Everett, Washington. It will go into operation when the mill starts in February.

The New Officers

At the afternoon discussion meeting the nominating committee reported nominations for the new officers and the election was unanimous.

George W. Brown, superintendent of the Inland Empire Paper Company, Spokane, was elected chairman for the ensuing year. Mr. Brown was first vice-chairman this year.

George Cropper, superintendent of the Olympic Forest Products Company, Port



GEORGE CROPPER
First Vice-Chairman



GEORGE W. BROWN
Chairman



R. C. ONKELS
Second Vice-Chairman

PACIFIC PULP & PAPER INDUSTRY

15



JAMES P. V. FAGAN
Third Vice-Chairman

Angeles, was chosen as first vice-chairman.

R. C. Onkels, superintendent of the Westminster Paper Company, New Westminster, B. C., was chosen as second vice-chairman.

James P. V. Fagan, superintendent of the Puget Sound Pulp & Timber Company of Anacortes, Washington, was elected third vice-chairman.

H. A. Des Marais was reelected to a third term as secretary-treasurer.

George W. Brown, the new chairman, has been with the Inland Empire Paper Company since 1913. His broad experience of many years embraces almost all types of paper. Previous to his coming West, Mr. Brown was with Spanish River, International Paper Company at Glens Falls, Finch, Pruyn & Company, the Union Bag & Paper Company at Hudson Falls, and the Great Northern Paper Company at Madison, Maine.

Retiring Officers

The officers who served the Pacific Coast Division during 1935-1936 were:

Ferdinand Schmitz, Jr., assistant manager of the Rainier Pulp & Paper Company, Shelton, chairman; George W. Brown, first vice-chairman; George Cropper, second vice-chairman; R. C. Onkels, third vice-chairman, and H. A. Des Marais, secretary-treasurer.

The papers on the program were arranged for by the officers.

Retiring Chairman Ferdinand Schmitz was given a vote of appreciation for his work during the year.

Saturday Luncheon and Dinner

Convention Chairman A. S. Quinn announced at the luncheon that there would be no speakers either at the luncheon or at the dinner dance Saturday evening, a departure from the usual convention procedure which struck a responsive note in his audience. There was music during the luncheon and afterward Mr. Quinn called on Mr. Tom Shields to tell some of his humorous stories.

At dinner Saturday evening the superintendents and their ladies were entertained by two good singers and a stringed orchestra.

Before the dance band started to play Dr. Robert E. Brown exhibited his moving pictures of the rayon making process for the benefit of the ladies attending the meeting.

Retiring Chairman Ferdinand Schmitz, Jr., thanked Convention Chairman A. S. Quinn in behalf of the Superintendent's Association for staging a most entertaining and instructive meeting. That everyone agreed was shown by the hearty applause given Mr. Quinn.

Mr. and Mrs. L. S. McCurdy and their daughter braved stormy Puget Sound in their yacht rather than take any chances with the present disrupted ferry schedules from Port Townsend. Mr. McCurdy, who is paper mill superintendent for the National Paper Products Company at Port Townsend, reported that it was a very rough crossing but thoroughly enjoyable.



H. A. DES MARAIS
Secretary-Treasurer

The following registered at the superintendent's meeting:

Mr. Niles M. Anderson, Mr. and Mrs. Eber W. Badcon, Mr. and Mrs. Thos. J. Bannan, Mr. W. R. Barber, Mr. T. H. Beaune, Mr. C. H. Belvin, Professor W. L. Beuschlein, Mr. A. L. Bibbins, Mr. and Mrs. C. E. Braun, Mr. Martin Breuer, Mr. and Mrs. G. C. Brewster, Mr. Geo. W. Brown, Mr. R. S. Carey, Mr. and Mrs. O. S. Cauvel, Mr. Harold Cavin, Mr. R. E. Chase, Mr. E. W. G. Cooper, Mr. and Mrs. Geo. Cropper.

Mr. and Mrs. H. A. DesMarais, Mr. E. G. Drew, Mr. A. C. Dunham, Mr. and Mrs. Leon Dupuis, Mr. and Mrs. R. C. Erchingher, Mr. J. P. V. Fagan, Mr. Carl Dahlstrom, Mr. W. E. Foren, Mr. and Mrs. Kenneth B. Hall, Mr. and Mrs. John E. Hassler, Dr. W. Hirschkind, Mr. and Mrs. Walter S. Hodges, Mr. and Mrs. E. R. Johnson, Mr. W. A. Kelly, Mr. W. N. Kelly, Mr. N. A. Lewthwaite, Mr. and Mrs. Ralph Lungren.



GEORGE SEYBOLD
Described the Spray Type Sulphur Burner



JAMES G. RAMSEY
Led Discussion



L. C. HAFFNER
Explained Electrodialysis

PACIFIC PULP & PAPER INDUSTRY



A. S. QUINN
General Chairman
Superintendent's Meeting

Mr. Jack Martin, Mr. John C. Manning, Mr. and Mrs. Bill Marshall, Mr. Guy F. Mitchell, Mr. T. E. Moffitt, Mr. and Mrs. W. M. Osborne, Mr. and Mrs. R. T. Petrie, Mr. and Mrs. J. G. Ramsey, Mr. H. H. Richmond, Mr. S. A. Salmonson, Mr. and Mrs. Ferdinand Schmitz, Mr. and Mrs. Harlan Scott, Mr. F. C. Shaneman, Mr. and Mrs. B. L. Shera, Mr. K. Shibley, Mr. Tom Shields, Mr. and Mrs. Ray Smythe, Mr. and Mrs. E. G. Thompson, Mr. H. A. Vernet, Mr. and Mrs. A. S. Viger, Mr. E. P. Wood, Mr. F. J. Weleber, Mr. and Mrs. Arthur Zimmerman, Mr. C. V. Smith, Mr. C. M. Server, Mr. Geo. G. Guild, Mr. Dan Charles, Mr. and Mrs. Frank A. McKenzie, Mr. and Mrs. Claude P. Kelly, Mr. Roy Sette, Mr. Joe Schulein, Mr. Geo. H. Linsley.

Mr. L. H. Wear, Mr. and Mrs. L. S. McCurdy, Dr. Robert E. Brown, Mr.



FERDINAND SCHMITZ, JR.
Retiring Chairman

Geo. Seybold, Mr. G. H. McGregor, Mr. J. D. Fraser, Mr. and Mrs. L. C. Haffner, Mr. and Mrs. E. E. Kertz, Mr. G. S. Brazeau, Mr. G. W. Brown, Mr. E. F. Huckstep, Mr. C. W. Morden, Mr. A. W. Stegman, Mr. and Mrs. A. S. Quinn.

PORT TOWNSEND IMPROVEMENTS

The National Paper Products Company's kraft paper and board mill at Port Townsend, Washington, installed a Ross-Grewin system on the number two machine the middle of November.

One new E. D. Jones & Sons Jordan has been installed and two new Bird screens are now being put in.

A bag plant has just been completed with seven high capacity bag machines. These have a collective capacity of four million bags per week per shift. At present they are running one shift.

CROWN - WILLAMETTE INCREASES INCOME, PAYS MORE TAXES, RETIRE BONDS, PAYS DIVIDEND

The Crown-Willamette Paper Company and subsidiaries, including Pacific Mills Limited, for the six months ending October 31st, 1935, showed a net profit of \$1,105,002 as compared with \$924,878 for the same period in 1934, an increase of \$180,124. Income taxes increased in the 1935 period \$36,455, from \$189,474 in 1934 to \$225,929 in the comparable six months period of 1935.

Profit before depreciation, depletion, bond interest and income taxes was \$3,231,949 in the six months ending October 31st, 1935, as compared with \$3,147,744 for the same 1934 period, an increase of \$84,205. Depreciation, depletion and bond interest were lower in the 1935 period than in 1934.

Crown-Willamette has called for redemption on January 1st, at 103 and accrued interest, \$5,500,000 of first mortgage sinking fund 6 per cent gold bonds due January 1st, 1951. At present the funded debt is \$15,120,000. After the bond redemption January 1st the funded debt will be reduced to \$9,620,000. Crown-Willamette will be ahead of sinking fund requirements when this redemption is completed.

If there is no resort to temporary borrowing to meet the retirement of the bonds, the reduction in debt will cut yearly interest requirements approximately \$330,000.

As of April 30th, 1935, Crown-Willamette Paper Company had \$14,740,519 (\$9,196,619 "earned") against which to charge this bond retirement. On that date Crown held quick assets of \$6,287,649 in cash, receivables and securities together with about \$2,000,000 in finished products.

Savings on interest can be applied to reducing more rapidly the accumulated unpaid dividends on the \$7 and \$6 preferred stocks.

Two dividends have been declared of \$1 each on the \$7 first preferred stock. One is payable December 14th and the other January 1st, leaving an arrearage of \$11.25 a share on the first preferred stock.

The first preferred stock of Crown-Willamette was admitted to the list of the San Francisco Stock Exchange at the opening of business Thursday, December 5th. The new listing covers 200,000 shares of no-par stock.

KETCHEN OF B. C. PULP

William L. Ketchen, formerly manager of the Port Alice mill of B. C. Pulp & Paper Company, died in Vancouver, B. C., November 16. During the last year he had been attached to the head office in Vancouver and for several months had been in failing health. He was 60 and a native of England.

Mr. Ketchen came to the Pacific Coast about twelve years ago to join Whalen Pulp & Paper Mills, which was later absorbed by B. C. Pulp. Before that he had been with the Riordan Paper Mills at Kipawa and previously had been associated with the management of the Riordan plant at Hawkesbury, Que. International Paper Company took over the Riordan properties a few years later.

One of the best known pulp men in British Columbia, Mr. Ketchen had spent more than a quarter century in the business. He was with Dodge Manufacturing Company in Montreal before entering the pulp and paper industry.

DR. FORBES DIES

Dr. Alexander Forbes, formerly company physician for Powell River Company, and one of the best known surgeons and physicians in the outlying settlements along the British Columbia coast, died in Vancouver November 4, aged 83. He was one of the discoverers of the rich Britannia copper mine on Howe Sound.

OLYMPIC FOREST ISSUES PREFERRED STOCK

The Olympic Forest Products Company of Port Angeles announced on December 6th, through Blyth & Company, an issue of 10,000 shares preferred stock, \$8 cumulative, together with voting trust certificates for 20,000 shares of common stock. The preferred and voting trust certificates were sold in units at a flat price of \$90 per unit. Each unit consisted of one share of preferred and voting trust certificates for two shares of common stock.

Blyth and Company on December 9th reported the entire issue had been sold.

The prospectus issued by Blyth & Company stated, "The current offering represents a resale of preferred stock and voting trust certificates for common stock, originally sold by the Olympic Forest Products Company to the S. D. Warren Company in 1930 and recently purchased by Blyth & Company."

The Olympic company has been making high grade bleached sulphite pulps for rayon and other cellulose products since April, 1933. At present more than fifty per cent of its total output is pulp for purposes other than paper manufacturing.

Earnings of Olympic Forest Products for the six months ending October 31st, 1935, were \$187,082 or \$4.67 a preferred share. For the year ending April 30th, 1935, earnings were \$361,983 or at the rate of \$9.05 a preferred share.

Accumulated and unpaid dividends on the preferred stock from June 1st, 1930, up to November 30th, 1935, totaled \$44 per share.

C. V. SMITH A PROUD FATHER

On November 13th a son was born to Mr. and Mrs. C. V. Smith of St. Helens, Oregon. Mr. Smith is chief electrician for the St. Helens Pulp & Paper Company.

Mr. and Mrs. Smith have been married twenty years and this is their first child.

INSTANTANEOUS DETERMINATION OF MOISTURE IN PULP BY THE MOISTURE REGISTER

By ROBERT L. STEVENS*

The value of an instrument or machine is directly proportional to its simplicity. The difficulty of preparing a paper about it likewise is proportional to its simplicity. The more simple an instrument the less there is to describe.

We have come to believe that a device has entered at least the outer gates of the realm of perfection when it is so simple that the layman is disappointed when he sees it. He thinks because it looks so simple it did not take any brains to concoct it. Non-technical visitors to our factory seem more impressed with instruments while in the early or complicated stages. For instance, an oven, a balance, a row of laboratory flasks and stills seem more impressive than the finished instrument which will do the work in a small fraction of the time on the turn of a wheel.

Development means simplification. The radio of 1922 with its multiplicity of controls, developed into the instrument of simple operation we know today. Tuning a radio no longer requires instruction and there is little to talk about on the subject. There was much to say about it in 1922.

There is not a whole lot to be said about this instrument, because it accomplishes its purpose in a few seconds when one lever is operated.

The simplest means is the most direct. In the moisture register the sample is tested by a direct means which avoids the tedious labor of oven testing and the inaccuracies of all indirect methods. The moisture is not required to transfer itself to some other substance. By indirect methods we mean the use of instruments which measure the physical or electrical change produced in an intermediate material such as cellophane or rayon. This principle requires that the moisture leave the pulp in favor of the hygroscopic element in the instrument proper. Knowing it usually requires several hours for the moisture to be driven out of pulp in a hot oven we early rejected, after some research these indirect or transfer methods.

Our instrument is used to measure moisture in pulp just as the watt-hour meter in your home measures electricity. So to describe this instrument to you briefly we say the moisture register is a self-contained electrical device employing modern circuits to utilize known electrical laws, so constructed that variations in the moisture content of pulp will be indicated on a meter in the instrument.

The operation does not depend on the electrical conductivity of material being tested nor is this instrument a capacity meter.

The moisture range of this instrument is from 81 to 89 percent bone dry. An-



other similar in appearance will indicate from 91 to 97 percent.

The calibration curve of the dry pulp instrument is of the same shape as in this machine, which is almost a straight line.

The introduction of new instruments to existing industries is no small job, no matter how accurate or needed they may be.

Much of our effort has been in the sawmills, where serious attention to the subject of moisture is a fairly new and in some places an unwelcome form of misery. But the customers have discovered it and now specify moisture content.

A sawmill operator wrote that he did not care to buy one of our lumber testers because (I quote from his letter): "But at this time we would have no use for such a machine. All our lumber in the yard is slightly damp anyway and, frankly, we would ship it if we thought it sufficiently dry for our customer's use and perhaps would prefer not to know the whole truth as to the moisture content."

Some mills cut off the end of lumber and some cut slices from the face for oven tests. Some oven dry it for two hours and some for six. Some have vents on their ovens and some do not. Some re-weigh samples while hot and some let them lay about for thirty minutes or more to cool. We were told in one plant that the open jar of coffee being heated in the oven during moisture tests would not make any difference because they did that every noon time. This same oven had a piece of asbestos held down with a brick to close the oven vents. The thermostat would function some time after the door had been open a full minute.

We have found that even some good looking ovens have wide temperature vari-

ations, due both to erratic thermostats and poor circulation.

The discrepancies in the oven method of testing moisture content, as well as the time taken in making oven tests, necessitates a machine such as the moisture register, which will give accurate tests immediately before it is too late for correction of errors that might occur in a mill run.

The moisture register for pulp is designed to give correct moisture readings from a single thickness of pulp, and is unaffected by variations in caliper.

The oven and balance as instruments of moisture determination are instruments of the past. They tell you what you did four hours ago or yesterday, while the need in a modern plant is for the determination of moisture, instantly.

The moisture register is modern in design and principle and provides a direct and instantaneous means of measuring moisture.

CROWN-ZELLERBACH INCREASES EARNINGS

For the six months ending October 31st the Crown-Zellerbach Corporation and subsidiaries other than Crown-Willamette Paper Company, reported a net profit of \$1,192,560 after depreciation, depletion, interest and taxes. This is equivalent to \$4.75 per share on 20,601 shares of preference stocks, series A and B outstanding.

In the comparable 1934 period the earnings were \$644,789 or \$2.57 a preference share.

CAVERHILL PASSES AWAY

The pulp and paper industry of the Pacific Northwest lost a good friend in the death at Victoria December 8 of Peter Z. Caverhill, 51, who for seventeen years had been chief forester for British Columbia. He had only just returned from a lumber sales promotion mission to South Africa, his second journey to that country within a year. He had been in poor health for some time, but it had been expected that the long voyage would bring his recovery.

Born in New Brunswick, Mr. Caverhill graduated from the university of that province and for some years worked in the Canadian government forest service, coming west in 1913 when H. R. MacMillan, now head of one of British Columbia's biggest lumber export enterprises, was organizing a provincial forest service. Later he was recalled to organize a similar service in New Brunswick, but he remained in the east only a short time. He succeeded M. A. Grainger, now president of Alberni-Pacific Lumber Company, as chief forester, and held that post ever since. He was recognized as one of the outstanding authorities on Northwest forestry and was highly regarded in the government service and by practical lumber and pulp and paper men.

The Instrument Company, Seattle.

Presented at the Fall Meeting of the Pacific Coast Division of the American Pulp & Paper Superintendents' Association, Seattle, December 7th, 1935.

PACIFIC PULP & PAPER INDUSTRY

DEVELOPMENTS AT POMONA

Interesting developments have been occurring lately at the California Fruit Wrapping Mills in Pomona. Mr. F. O. Fernstrom, president, advises that his company has had a successful year, both paper machines running at capacity.

A warehouse 75 by 350 feet of reinforced brick and steel construction was recently completed. Fifteen thousand square feet of this warehouse has been set aside for the Marcalus Manufacturing Company of Elizabeth, New Jersey, who will begin the installation of waxing equipment about December 15th.

The Marcalus Manufacturing Company is in the waxing converting business, and will take tissue from the California Fruit Wrapping Mills. The product is put up in cartons primarily for home consumption.

Three thousand square feet of the new warehouse has been made into a new and modern office for the California Fruit Wrapping Mills.

Mr. Fernstrom also advises PACIFIC PULP & PAPER INDUSTRY that his company has acquired the patents for a plant protector or cover to protect young plants in the field. It is known as the Sage Hi-Cap, and is made from oiled paper. A special spiral reinforcement system is employed to give sufficient



F. O. FERNSTROM

strength to the cover so it will stand rain and wind. Mr. Fernstrom states that the Hi-Cap is superior to other protectors and he is looking forward to a large volume of business in this line. The Hi-Cap in addition to possessing unusual strength is so designed that the plant underneath obtains an adequate supply of air.

Another patent acquired by the California Fruit Wrapping Mills embraces sanitary seat covers. The trade name is "Protecto." The chief market developed by Mr. Fernstrom is among the oil companies. A year ago when the business was acquired rest rooms in four hundred service stations were being supplied. Today the number has grown to four thousand stations.

Paper towels are also made for the service station trade.

WOODFIBRE IMPROVEMENTS

The Woodfibre mill of British Columbia Pulp & Paper Company is to have a Chemipulp installation as well as the company's Port Alice plant, it is announced by President Lawrence Killam.

Construction will get under way at Woodfibre about the end of January, and it is hoped to have the plant in production by the end of March. Construction has already commenced at Port Alice and the new process will be operative by the end of February, if the company's plans are carried out according to schedule.

The Woodfibre job will bring the B. C. Pulp construction program this winter to approximately a quarter million dollars.

Horton Steel Company of Erie, Ont., manufacturers of the Horton sphere, who had the contract for the Chemipulp installation at Port Alice, will also have the Woodfibre job. The Stebbins Engineering Company will line the acid accumulator with acid-resisting brick.

Laying of the pipe-lines is being handled at both mills by the company's own crews. Foundation work on the Port Alice project is making good progress. The Woodfibre plant has been having its "face lifted." New roofing has been put on some of the buildings and a new wharf built to replace the barges that used to serve for that purpose, with the result that the appearance of the pulp town has been materially altered. The Woodfibre plant has been shut down for three months, but will probably resume

production as soon as the present improvements have been completed.

Termination of the Canadian-Japanese trade war, which is expected from day to day, will be of immediate and far-reaching importance to B. C. Pulp. The general feeling is that when Japan resumes trading with Canada there will be a rush of orders to compensate for the loss of business during the four or five months in which the high surtaxes interrupted the normal flow of trade.

JERRY ALCORN APPOINTED
TECHNICAL DIRECTOR

Gerald F. (Jerry) Alcorn of the Pulp Division Weyerhaeuser Timber Company at Longview, has been selected as technical director of the Everett, Washington, mill by resident manager, G. S. Brazeau. He will have charge of the laboratory at the new unbleached sulphite pulp mill which is scheduled to start in February, 1936.

DeVane Hamilton, also from Longview, will be Mr. Alcorn's assistant.

Jerry Alcorn is a graduate of the University of Washington in chemistry, class of 1931. He has been at the Weyerhaeuser Longview pulp mill since his graduation.

Svarre Hazelquist was recently made assistant to George H. McGregor, technical director of the Pulp Division at Longview.

THE PULP MOISTURE REGISTER

*Displayed at the Superintendents' Meeting
December 7th*

Is now in production by The Instrument Company and will be available to interested pulp mills at an early date.

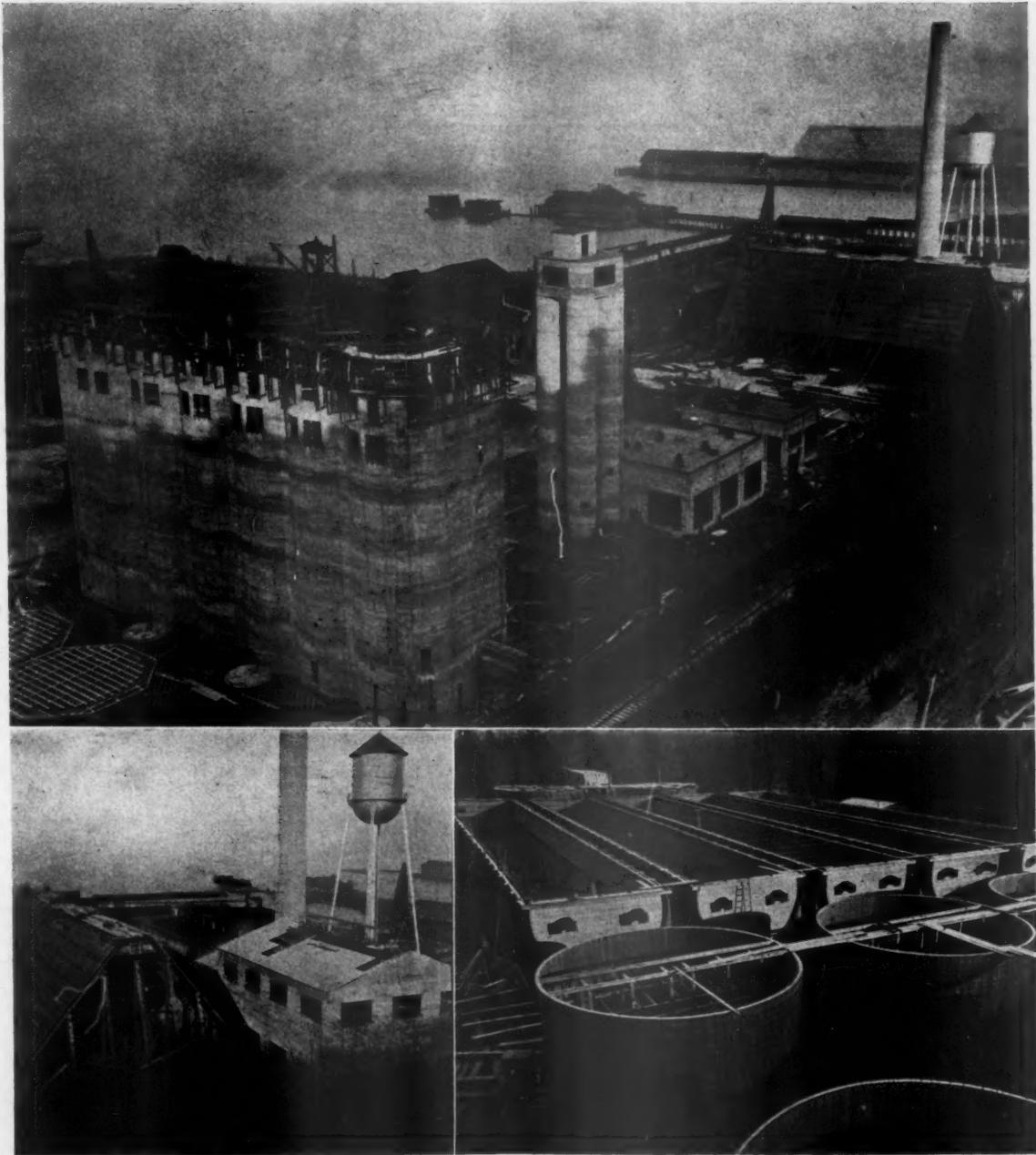
SCIENTIFIC SUPPLIES CO.

Telephone ELiot 1134

123 Jackson St., SEATTLE

WEYERHAEUSER UNBLEACHED MILL NEARING COMPLETION

150 Ton Plant at Everett, Washington, Scheduled
To Start in February



Construction views taken early in December of the 150-ton-per-day unbleached sulphite pulp mill being built at Everett, Washington, by the Pulp Division, Weyerhaeuser Timber Company. At the top: a general view showing, left to right, the blow pit foundations, the digester building (the digesters are completed), the acid towers and acid plant, the chip storage building and the power plant. The machine room which is not shown, is completely enclosed and the machine is being erected. Lower left: the chip storage building and the power plant. Lower right: the 15,000,000-gallon-per-day filter plant of unique design and built entirely of Douglas Fir.

A STUDY OF THE RELATION BETWEEN THE CHEMICAL AND PHYSICAL CHARACTERISTICS OF REPRESENTATIVE TYPES OF PULP

By GEO. H. McGREGOR *

Part III

ABSTRACT

A comprehensive study has been made on the relationship between pertinent chemical constants and significant physical properties of representative paper making pulps. Three standard type pulps such as Blue Denim, rag, Alpha and Mitscherlich pulps were degraded to definite degrees of cuprammonium viscosity by means of the three degrading influences to which paper pulps are usually subjected in their process of preparation such as acids, bleach, and heat. The pulps were degraded under definite conditions of time, temperature, and concentration to viscosities representing two-thirds, one-half and one-third the original value. Physical and chemical properties of the pulps were then determined by standard methods. The relationship noted throughout the experimental part of this paper point to the fact that: 1. Degradation of pulps can be followed by the cuprammonium test. 2. There appears to be a definite relation between viscosity and fold quality of various types of pulps. 3. Relation between physical and chemical properties of pulps and degrading influences is specific in nature. 4. It would appear that acid causes least degradation of cellulose, bleach next, and heat the greatest change in given qualities.

A comprehensive survey of the literature of the subject is offered along with a detailed discussion of latest concepts of cellulose structure.

6. Relation between viscosity and strength of the three standard pulps; each degraded by different agents to given viscosity.

In tables 9-11 inclusive we have listed the actual beating strength values of the three standard pulps degraded to various degrees of viscosity by means of the three selected degrading agents. There is a regular decrease in physical strength properties including mullen, fold, tear, and tensile with decrease in the viscosity of the cellulose. In other words, alteration in micellar structure of the cellulose unit caused by degrading agents is reflected in the decrease of the properties of hand sheets prepared from the beaten stocks.

There is to be noted a certain regularity in the degrading influence of the various reagents on the three standard stocks. In other words, the extent of degradation is dependent directly upon the chemical action of these agencies.

*Member T.A.P.P.I., Technical Director Weyerhaeuser Timber Company, Pulp Division, Longview, Washington.

Table 8 which is a summary of tables 11 to 35 inclusive indicates certain tendencies as regards the standard pulps and their reaction to the degrading agents under the conditions specified. There is in the case of bleached Mitscherlich pulp, Alpha pulp and rag half-stock, at complete degradation, a regularity of effect of alteration on the mullen, fold, tear and tensile strengths. It appears that under the conditions studied, acid hydrolysis causes the least loss in physical strength, calcium hypochlorite bleach solution next, and heat the greatest. On the other hand, the degrading agents exhibit a reversal of effectiveness in the case of the rag half-stock at slight and intermediate viscosities. Evidently at a viscosity of 200, although the micellar structure has been changed somewhat, the dehydrating action of heat causes least loss in strength, and acid the greatest. This may be tied up somewhat with the rate of alteration. There is a very rapid change in viscosity of rag half-stock during the initial stages of degradation and heat tends to cause this change at a much more rapid rate than acid. Apparently the long exposure to acid, under the conditions stipulated, for a viscosity change of from 300 to 200 has more effect on the physical properties of the cellulose than a short exposure to heat which causes the same viscosity change.

At complete degradation, or low viscosity, the hydrolysis or depolymerization action of sulfuric acid under the conditions stipulated, is least effective on the strength properties of hand sheets prepared from the three standard stocks, the

combined hydrolysis and oxidation action of calcium hypochlorite bleach solution tend to bring about a greater loss in physical strength; and the action of heat, which may cause complete disruption of the cellulose micelle, effects the greatest loss in strength. Retention of physical strength of hand sheets is also possible due to an adhesive force of water of hydration of the cellulose fibers. Having once expelled water of hydration and capillary water from the cellulose fibers by means of heat, it is impossible to wet the fibers to the same degree had they not been dried; therefore, the adhesive force of capillary or collodially bound water is sacrificed.

Since it has been established that under the conditions of degradation acid causes least loss of physical strength and heat the greatest, it is questionable what the effect of other concentrations of reagents and degrees of heat would have on these strength properties. The same relation might hold on the intensity of the reaction between cellulose and the degrading agent might be such that the order of influence might be altered somewhat.

7. Relation between Viscosity and strength of the three standard pulps degraded to the same Viscosity by the different agents:

In tables 12-13-14 there is listed the relationship between the various strength properties of the three standard pulps and the methods of degradation, namely acid, bleach and heat. In other words, we degraded three different stocks with a single degrading agent to definite viscosities to determine whether or not the strength properties were comparable. Again it is impossible to compare the results on rag half-stock with that of the wood pulps. This situation can be explained by the different methods of refining the two stocks and of the preparation of the hand sheets, the rag half-stock having been refined in a 10-pound beater and sheets prepared on a William's sheet mold, while all work on the wood pulp was carried out on the Valley pulp testing equipment. If we compare the two wood pulp qualities, we note a general relationship between viscosity and strength, low viscosity indicating low strength and high viscosity, high strength. But even in this method of comparison there are discrepancies. It seems that the strength of a stock at a given viscosity is altered to a much greater extent by oven aging than acid or bleach degradation. Nevertheless, it would appear that there is a potential relationship between these two properties of given stocks.

Perhaps no phase of the development of the Pacific Coast pulp and paper industry is more important than a more comprehensive knowledge of the characteristics of types of pulp. Therefore Pacific Pulp & Paper Industry takes special pleasure in presenting herewith the third installment of a study of the relation between the chemical and physical characteristics of representative types of pulp by Geo. H. McGregor. In the various chapters there will be presented an historical survey, a statement of the problem, a discussion of methods, a description of the experiments and the effect of various treatments on the standard stocks, a general summary and conclusions. — Editor.

TABLE 8
Effect of Various Degrading Agents on Strength Tests of Rag Half-Stock, Alpha Pulp and Bleached Spruce Mitscherlich at Various Viscosities

Rag Half-Stock			Alpha			Mitscherlich		
200	100	20	25	15	7	15	7	
Heat	Acid	Acid	Acid	Acid	Acid	Acid	Acid	Mullen
Bleach	Heat	Bleach	Heat	Bleach	Heat	Bleach	Bleach	
Acid	Bleach	Acid	Bleach	Acid	Bleach	Acid	Bleach	
Heat	Heat	Acid	Acid	Acid	Acid	Acid	Acid	Fold
Bleach	Bleach	Heat	Bleach	Bleach	Heat	Bleach	Bleach	
Acid	Acid	Heat	Bleach	Acid	Bleach	Acid	Bleach	
Heat	Heat	Acid	Acid	Acid	Bleach	Acid	Bleach	Tear
Bleach	Bleach	Heat	Bleach	Bleach	Heat	Bleach	Bleach	
Acid	Acid	Heat	Bleach	Acid	Bleach	Acid	Bleach	
Heat	Heat	Acid	Acid	Acid	Bleach	Acid	Bleach	Tensile
Bleach	Bleach	Heat	Bleach	Bleach	Heat	Bleach	Bleach	
Acid	Acid	Heat	Bleach	Acid	Bleach	Acid	Bleach	
Heat	Heat	Acid	Acid	Acid	Bleach	Acid	Bleach	
Bleach	Bleach	Heat	Bleach	Bleach	Heat	Bleach	Bleach	

TABLE 9
Effect of Degradation in the Relation Between Strength of Rag Half-Stock and the Viscosity Values

Acid Degradation					
Viscosity	Freeness at Max. Mullen	Maximum Fold	Tear Factor at Max. Mullen	Per Cent Mullen	Maximum Tensile Factor
300	445	385	300	90	27.0
208	390	129	270	77	26.2
110	270	98	200	75	25.5
25	250	84	192	72	25.0
Bleach Degradation					
300	445	385	300	90	27.0
200	380	285	272	83	25.1
123	330	133	232	70	23.0
23	300	49	170	58	20.6
Heat Degradation					
300	445	385	300	90	27.0
210	395	375	282	87	26.0
94	385	132	237	72	22.0
27	285	53	170	62	21.2

TABLE 10
Effect of Degradation in the Relation Between Strength of Alpha Pulp and the Viscosity Values

Acid Degradation					
Viscosity	Freeness at Max. Mullen	Maximum Fold	Tear Factor at Max. Mullen	Per Cent Mullen	Maximum Tensile Factor
34.1	277	2149	125	100	35.1
24.5	280	1825	112	93	33.8
14.8	280	1075	98	86	30.9
8.4	260	230	82	75	28.2
Bleach Degradation					
34.1	277	2149	125	100	35.1
23.1	287	1280	104	85	33.9
14.5	285	350	100	78	31.8
9.6	162	50	62	67	28.2
Heat Degradation					
34.1	277	2149	125	100	35.1
25.0	282	178	90	75	29.7
14.7	197	40	59	56	25.7
9.0	270	3	33	34	17.4

8. Relation between Alpha-Cellulose and strength of the three standard pulps:

Tables 15-16-17 show the alpha-cellulose content or alkali resistance property of various types of cellulose and strength. Somewhat similar situation exists here as in paragraph 7. The rag half-stock method of hand sheet preparation inter-

feres with any comparison that might be made. Here, also, we note a general tendency toward alpha-cellulose content relationship of the wood pulps and mullen, fold, tear and tensile. Therefore, given three different pulps and degrading by a definite agent to a given viscosity we should expect some similarity of physical quality in the resultant pulps.

9. Relation between Copper Number and Strength of the Three Standard Pulps:

Tables 18, 19 and 20 offer a picture of copper number or reducing properties of the cellulose and physical strength. There is an agreement between this characteristic and strength quality similar to that found in the case of viscosity and alpha-cellulose content. In other words, low copper number indicates high strength, and high copper number low strength. An apparent change in reducing properties due to aldehyde formation of the cellulose or constituents other than cellulose in the pulp is accompanied by a corresponding change in mullen, tear, fold and tensile.

10. Relation between Viscosity and Strength of Rag Half-Stock, Alpha Pulp and Mitscherlich Pulp.

In tables 21, 22 and 23 we note the organized data relating to the strength of the three standard pulps when arranged in increasing viscosity values irrespective of method of degradation. In this instance we are interested in whether or not degradation of a given stock by various agents causes a regular or irregular alteration in strength. In general it is evident that for the Rag Half-Stock, Alpha pulp and bleached Mitscherlich pulp, there is a definite relationship between viscosity and strength irrespective of the agent used. One notable exception is the effect of heat. It would appear that in certain instances, although the viscosity is high, the heat has caused marked variations in physical quality.

11. Relation between Alpha-Cellulose and Strength of Rag Half-Stock, Alpha Pulp and Bleached Mitscherlich Pulp.

In tables 24, 25 and 26 we have listed those relations between each of the three standard pulps at various alpha-cellulose contents which were brought about by the three degrading agents previously mentioned. A general but none too well defined relationship exists in these instances as in the case of paragraph 10. High alpha content seems to indicate high strength. Low alpha content of a given stock, regardless of the method of causing same, points to a pulp of inferior strength quality. Here also are notable exceptions. In the case of Rag Half-Stock, acid hydrolysis at high viscosity appears to have markedly affected the physical strength. Exceptions are noted in the case of heat degradation and a given viscosity. The dehydrating action of heat and possible oxidation seems to have reduced the physical qualities to points much lower than the other degrading agents, when degraded to the same alpha-cellulose content.

12. Relation between Copper Number and Strength of the Three Standard Pulps.

Tables 27, 28 and 29 show the results of physical properties of the three standard pulps and their relation to copper number or reducing quality resulting from treatment by the three agents mentioned. In this instance, there seems to be a rather precise regularity between copper number and strength of the three stocks. Although the real significance of the copper number test is sometimes questionable, each stock changes in quality in a regular progressive manner when subjected to the three previously mentioned degrading influences. Tensile, tear, fold, and mullen appear to be related to the copper number value. Here we need not consider the different methods of refining or sheet preparation of the different stocks, since we are comparing each stock itself with the three degrading agents.

PACIFIC PULP & PAPER INDUSTRY

13. Relation between Viscosity and Strength of the Three Standard Pulps irrespective of Method of Degradation.

In table 30 the data is arranged in such a manner as to compare viscosity and strength regardless of the pulp and method of degradation. In other words if we consider a given pulp, degraded by some given agent to given various viscosities do we have a corresponding relative change in physical quality? This table is most significant, for in this manner a comparison would be made of commercial pulps. Are we justified in saying that a pulp of a certain viscosity should have a given strength value? In this table our conclusions must be limited to the wood pulp cellulose values since, as mentioned before, the method of refining and preparation of hand sheets in the case of wood pulps differed from that of the rag half-stock. Nevertheless, it is quite evident that here we find little or no tendency toward a relationship between viscosity and strength. Although the viscosity values are listed in increasing increments, the values listed for mullen, fold, tear and tensile seem to fluctuate in a more or less haphazard manner, pointing to very little regularity. It would appear, therefore, that changes in micellar structure due to oxidation, hydrolysis, or dehydration, or a combination of any or all, may affect the physical quality of hand sheets prepared from the cellulose in such a manner that values for mullen, tear, fold and tensile are not related to viscosity.

14. Relation between Alpha-Cellulose and Strength of the Three Standard Pulps regardless of the Method of Degradation.

Table 31 indicates similar data to that listed in paragraph 13 with the exception that alpha-cellulose content, or alkali resistance, of the cellulose is compared with strength properties of the three types of cellulose when prepared in hand sheet form. As in paragraph 13 we are attempting to find comparison between physical quality and alpha-cellulose content of three pulps degraded by three different agents to various degrees. Again there is to be noted a decided irregularity between these two qualities of the three types of cellulose. The tabulated results seem to indicate that high alpha content does not necessarily mean high strength nor that low alpha content indicates low strength. It would seem, then, that the effectiveness of the three degrading agents varies with the type of stock and conditions of treatment insofar as physical strength and alpha content is concerned. A degrading agent may alter the alpha content but little, yet cause decided fluctuations in physical quality.

15. Relation between Copper Number and Strength of the Three Standard Pulps regardless of the Method of Degradation.

Table 32 illustrates the relationship between copper number value and strength quality of various types of cellulosic material when treated by the three degrading agents in question. As in paragraph 13 and 14 there seems to be no correlation between reducing properties and physical strength when considering unlike types of pulps and various methods of degradation. In other words, given a pulp of certain copper number, or reducing property, we per number, or reducing property, we would be unable to anticipate the physical strength of hand sheets prepared from

TABLE 11
Effect of Degradation on the Relation Between Strength of Bleached Mitscherlich Pulp and the Viscosity Values

Viscosity	Freeness at Max. Mullen	Acid Degradation			Per Cent Mullen	Maximum Tensile Factor
		Maximum Fold	Tear Factor at Max. Mullen	Max. Mullen		
24.2	387	508	91	104	39.0	
15.1	225	450	66	92	34.0	
8.0	155	220	54	81	29.5	
		Bleach Degradation				
24.2	387	508	91	104	39.0	
12.5	230	382	53	80	30.0	
8.1	145	65	43	72	26.5	
		Heat Degradation				
24.2	387	508	91	104	39.0	
15.3	265	165	59	67	27.2	
9.1	175	6	30	36	18.7	

TABLE 12
Relation Between Viscosity and Strength of the Three Standard Pulps

Pulp.	Viscos.	Acid Degraded			Tensile Max.
		Mullen Max.	Fold Max.	Max. Mullen Tear at	
Mitscherlich	8.0	81	220	54	29.5
Alpha	8.4	75	230	82	28.2
Alpha	14.8	86	1075	98	30.9
Mitscherlich	15.1	92	450	66	34.0
Alpha	24.5	93	1825	112	33.8
Rag	25.0	72	84	192	25.0
Rag	110.0	75	98	200	25.5
Rag	208.0	77	129	270	26.2

TABLE 13
Bleach Degraded

Mitscherlich	8.1	72	65	43	26.5
Alpha	9.6	67	50	62	28.2
Mitscherlich	12.5	80	347	53	30.0
Alpha	14.5	78	350	100	31.8
Rag	23.0	58	48	170	20.6
Alpha	23.1	85	1280	104	33.9
Rag	123.0	70	133	232	23.0
Rag	200.0	83	285	272	25.1

TABLE 14
Heat Degraded

Alpha	9.0	34	3	33	17.4
Mitscherlich	9.1	36	6	30	18.7
Alpha	14.7	56	40	58	25.7
Mitscherlich	15.5	67	165	59	27.2
Alpha	25.0	75	178	90	29.7
Rag	27.0	62	53	170	21.2
Rag	94.0	72	132	237	21.8
Rag	210.0	87	375	282	26.0

TABLE 15
Relation Between Alpha-Cellulose and Strength of the Three Standard Pulps

Pulp.	Alpha-Cellulose	Acid Degraded			Max. Tensile
		Max. Mullen	Max. Fold	Tear at Max. Mullen	
Mitscherlich	79.4	81	220	54	29.5
Mitscherlich	80.7	92	450	66	34.0
Alpha	85.6	75	230	82	28.2
Alpha	87.1	86	1075	98	30.9
Alpha	89.0	93	1825	112	33.8
Rag	93.5	72	84	192	25.0
Rag	96.9	77	129	270	26.2
Rag	97.2	75	98	200	25.5

TABLE 16
Bleach Degraded

Pulp.	Alpha-Cellulose	Max. Tensile			Max. Tensile
		Max. Mullen	Max. Fold	Tear at Max. Mullen	
Mitscherlich	78.4	72.3	65	43	26.5
Mitscherlich	79.3	80.7	382	53	30.0
Alpha	83.5	67.0	62	62	28.2
Alpha	86.6	78.0	249	100	31.8
Alpha	88.4	85.2	1280	104	33.9
Rag	91.7	58.0	49	170	20.6
Rag	95.0	70.0	133	232	23.0
Rag	96.2	83.0	285	272	25.1

PACIFIC PULP & PAPER INDUSTRY

23

TABLE 17
Heat Degraded

Pulp.	Alpha-Cellulose	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Alpha	77.2	34.4	3	33	17.4
Mitscherlich	77.8	36.0	6	30	18.7
Mitscherlich	78.5	67.5	165	59	27.6
Alpha	86.0	56.0	40	58	25.7
Alpha	87.7	75.0	178	90	29.7
Rag	94.5	62.0	53	170	21.2
Rag	95.6	72.0	132	237	21.8
Rag	95.7	87.0	375	282	26.0

TABLE 18
Relation Between Copper Number and Strength of the Three Standard Pulps

Pulp.	Copper Number	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Rag	.137	77	129	270	26.2
Rag	.148	75	98	200	25.5
Rag	.423	72	89	192	25.0
Alpha	1.04	93	1825	112	33.8
Alpha	1.21	86	1075	98	30.9
Alpha	1.24	75	230	82	28.2
Mitscherlich	2.77	92	450	66	34.0
Mitscherlich	2.84	81	220	54	29.5

TABLE 19
Bleach Degraded

Pulp.	Copper Number	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Rag	.105	83	285	270	26.2
Rag	.317	70	133	232	23.0
Rag	.624	58	49	170	20.6
Alpha	1.09	85	1280	104	33.9
Alpha	1.40	78	249	100	31.8
Alpha	1.71	67	62	62	28.2
Mitscherlich	2.90	80	382	53	30.0
Mitscherlich	2.98	72	65	43	26.5

TABLE 20
Heat Degraded

Pulp.	Copper Number	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Rag	.121	87	375	282	26.0
Rag	.158	72	132	237	21.8
Rag	.211	62	53	170	21.2
Alpha	1.16	75	178	90	29.7
Alpha	1.66	56	40	58	25.7
Alpha	2.25	34	3	33	17.4
Mitscherlich	2.96	67	165	59	27.6
Mitscherlich	3.11	36	6	30	18.7

TABLE 21
Relation Between Viscosity and Strength of Rag Half-Stock

Method of Degradation	Viscosity	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Bleach	23.0	58.0	49	170	20.6
Acid	25.0	72.0	89	192	25.0
Heat	27.0	62.0	53	170	21.2
Heat	94.0	72.0	132	237	21.8
Acid	110.0	75.0	98	200	25.3
Bleach	123.0	70.0	133	232	23.0
Bleach	200.0	83.0	285	272	25.1
Acid	208.0	77.0	129	270	26.2
Heat	210.0	87.0	375	282	26.0
Original	300.0	90.0	385	300	27.0

TABLE 22
Relation Between Viscosity and Strength of Alpha Pulp

Method of Degradation	Viscosity	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Acid	8.4	75	230	82	28.2
Heat	9.0	34	3	33	17.4
Bleach	9.6	67	50	62	28.2
Bleach	14.5	78	350	100	31.8
Heat	14.7	56	40	58	25.7
Acid	14.8	86	1075	98	30.9
Bleach	23.1	85	1280	104	33.9
Acid	24.5	93	1825	112	33.8
Heat	25.0	75	178	90	29.7
Original	34.1	100	2149	125	33.8

this pulp. In the three pulps mentioned, namely Rag, Alpha and bleached Mitscherlich sulfite, we note three decided degrees of copper number values, yet there is very little agreement between these values and mullen, tear, fold and tensile. It would appear that insofar as viscosity, alpha-cellulose, and copper number values are concerned we would not be justified in stating that given a definite value for either we would necessarily expect a given strength value. Although the influence of a degrading agent on a given pulp under specified conditions is specific in nature, it is questionable what that same reagent would do to a second pulp under similar circumstances.

16. Relation between Physical and Chemical Properties of a few representative domestic and foreign commercial type Bleached Sulfite Pulps.

Table 33 indicates values representing physical and chemical properties of commercial bleached sulfite pulps. The mullen test has been arbitrarily chosen as the basis of comparison of the various qualities simply because this represents probably the most widely applied characteristic. It would seem that there is but a slight correlation between physical and chemical qualities. One must recognize the fact that a multiplicity of variables enter into consideration when attempting to compare pulps from various mills and different sections of the country. Inherent variables in the wood itself such as type, age, rate of growth, seasoning and size of chip enter into the picture. In the digestion process we have direct cooking, indirect, direct heating and circulation, and numerous ramifications of each of these systems. Numerous procedures for bleaching are used commercially such as single stage hypochlorite, double stage hypochlorite, three-stage, the use of acids and as brightening agents and, the use of anti-chlors, all of which tend to inflict their own influence on the resultant product. Drying processes include air drying, steam drying with or without vacuum, hot air, all at a variety of temperatures. It is hardly conceivable then that pulps on the market today should exhibit any similarity or correlation between their different physical and chemical characteristics.

CHAPTER V

General Summary

A study has been made of the relationship between certain chemical and physical qualities of three representative types of paper-making cellulosic materials. Blue denim rag half-stock, a commercial grade of spruce Alpha pulp, and a bleached Mitscherlich sulfite pulp were selected as the raw materials for treatment. Two per cent sulfuric acid at 5 per cent consistency, calcium hypochlorite bleach solution at 5 grams of chlorine per liter and 5 per cent consistency, and heat at 105 degrees C. were chosen as the degrading agents. Cuprammonium viscosity, alpha-cellulose content, and copper number constituted the chemical qualities studied. Mullen strength, fold, tear and tensile were the physical properties considered.

The general procedure, as previously outlined, was to degrade the three representative pulps by the three agents mentioned to certain viscosities and then to note any correlation between chemical

PACIFIC PULP & PAPER INDUSTRY

constants and physical properties of hand sheets prepared from the pulps in question beaten in the tub type laboratory beater.

The degree of degradation was followed by means of the cuprammonium viscosity test as it is assumed to offer the best indication of an alteration in the nature of the cellulose micelle.

A survey of the data outlined in the body of this thesis indicates certain directional tendencies which might be listed as follows:

1. As noted in the historical section of this thesis, a survey of the literature showed very little, if any, comprehensive work on physical and chemical relationship of commercial pulps. Certain problems have been studied, such as a study of a single physical and chemical property.

2. The list of chemical constants and physical properties of the three standard pulps chosen indicate radically different chemical states and physical qualities. This being the usual condition in commercial pulps.

3. The rate of degradation of the three standard pulps as exemplified by the viscosity test exhibits a general tendency in that regardless of the degrading agent the viscosity rapidly decreases during the initial stages of degradation. Nevertheless, though the viscosity of the rag half-stock has decreased to a considerable extent, it is materially greater than that value given for the wood pulps.

4. The change in viscosity of the three pulps caused by acid, bleach and heat degradation is accompanied by a regular alteration in the alpha-cellulose content of the three stocks.

5. The change in the viscosity of the three pulps caused by acid, bleach and heat degradation is also accompanied by regular alteration in the copper number of the three stocks.

6. The change in alpha-cellulose content of the three pulps caused by acid, bleach and heat degradation is accompanied by a regular alteration in the copper number of the three stocks.

7. The decrease in the viscosity of each of the three stocks when degraded by each of the three agents is in every instance followed by a corresponding decrease in mullen, fold, tear and tensile strength.

8. Insofar as alpha-cellulose content and copper number is concerned, as mentioned under Chapter IV, section 7 above, the same conclusions apply.

9. Disregarding the method of degradation and comparing viscosity and strength of each of the three pulps in question we note a general tendency toward correlation in that increase in viscosity is accompanied by increase in physical strength.

10. The results would seem to indicate that there is a definite relationship between the viscosity of a pulp and the fold. This seems to apply to all pulps irrespective of method of preparation.

11. Disregarding the method of degradation and comparing alpha-cellulose content and strength, and copper number and strength, we again note a general tendency toward the same correlation as mentioned in paragraphs 9 and 10 above.

12. Disregarding the type of pulp and method of degradation and comparing the viscosity test and physical quality we note a decided lack of correlation. In

TABLE 23
Relation Between Viscosity and Strength of Mitcherlich Pulp

Method of Degradation	Viscosity	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Acid	8.0	81	220	54	29.5
Bleach	8.1	72	65	43	26.5
Heat	9.1	36	6	30	18.7
Bleach	12.5	80	347	53	30.0
Acid	15.1	92	450	66	34.0
Heat	15.5	67	165	59	27.2
Original	24.2	104	508	91	39.0

TABLE 24
Relation Between Alpha-Cellulose and Strength of Rag Half-Stock

Method of Degradation	Alpha-Cellulose	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Bleach	91.70	58.0	49	170	20.6
Acid	93.50	72.0	89	192	25.0
Heat	94.50	62.0	53	170	21.2
Bleach	95.00	70.0	133	232	23.0
Heat	95.68	72.0	132	237	21.8
Heat	95.75	87.0	375	282	26.0
Bleach	96.25	83.0	285	272	25.1
Original	96.51	90.0	385	300	27.0
Acid	96.90	77.0	129	270	26.2
Acid	97.20	75.0	98	200	25.5

TABLE 25
Relation Between Alpha-Cellulose and Strength of Alpha Pulp

Method of Degradation	Alpha-Cellulose	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Heat	77.2	34.4	3	33	17.4
Bleach	83.5	67.0	62	62	28.2
Acid	85.6	75.0	230	82	28.2
Heat	86.0	56.0	40	58	25.7
Bleach	86.6	78.0	249	100	31.8
Acid	87.1	86.0	1075	98	30.9
Heat	87.7	75.0	178	90	29.7
Bleach	88.4	85.2	1280	104	33.9
Acid	89.0	93.0	1825	112	33.8
Original	89.2	100.0	2149	125	33.8

TABLE 26
Relation Between Alpha-Cellulose and Strength of Bl. Mitscherlich

Method of Degradation	Alpha-Cellulose	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Heat	77.8	36.0	6	30	18.7
Bleach	78.4	72.3	65	43	26.5
Heat	78.5	67.5	165	59	27.6
Bleach	79.3	80.7	382	53	30.0
Acid	79.4	81.0	220	54	29.5
Acid	80.7	82.0	450	66	34.0
Original	82.7	104.0	508	91	39.0

TABLE 27
Relation Between Copper Number and Strength of Rag Half-Stock

Method of Degradation	Copper Number	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Original	0.105	90	385	300	27.0
Bleach	0.105	83	285	270	26.2
Heat	0.121	87	375	282	26.0
Acid	0.137	77	129	270	26.2
Acid	0.148	75	98	200	25.5
Heat	0.158	72	132	237	21.8
Heat	0.211	62	53	170	21.2
Bleach	0.317	70	133	232	23.0
Acid	0.423	72	89	192	25.0
Bleach	0.624	58	49	170	20.6

TABLE 28
Relation Between Copper Number and Strength of Alpha Pulp

Method of Degradation	Copper Number	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Original	.97	100	2149	123	35.1
Acid	1.04	93	1825	112	33.8
Bleach	1.09	85.2	1280	104	33.9
Heat	1.16	75.0	178	90	29.7
Acid	1.21	86.0	1075	98	30.9
Acid	1.24	75.0	230	82	28.2
Bleach	1.40	78.0	249	100	31.8
Heat	1.66	56.0	40	58	25.7
Bleach	1.71	67.0	62	62	28.2
Heat	2.25	34.4	3	33	17.4

TABLE 29

Relation Between Copper Number and Strength of Bl. Mitscherlich

Method of Degradation	Copper Number	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Original	2.72	104	508	91	39.0
Acid	2.77	92	450	66	34.0
Acid	2.84	81	220	54	29.5
Bleach	2.90	80.7	382	53	30.0
Heat	2.96	67.5	165	59	27.6
Bleach	2.98	72.3	65	43	26.5
Heat	3.11	36.0	6	30	18.7

TABLE 30

Relation Between Viscosity and Strength of the Three Standard Pulps Regardless of Method of Degradation

Pulp.	Viscos.	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Mitscherlich	8.0	8.1	220	54	29.5
Mitscherlich	8.1	72	65	43	26.5
Alpha	8.4	75	230	82	28.2
Alpha	9.0	34	3	33	17.4
Mitscherlich	9.1	36	6	30	18.7
Alpha	9.6	67	50	62	28.3
Mitscherlich	12.5	80	347	53	30.0
Alpha	14.5	78	350	100	31.8
Alpha	14.7	56	40	58	25.7
Alpha	14.8	86	1075	98	30.9
Mitscherlich	15.1	92	450	66	34.0
Mitscherlich	15.5	67	72	59	27.2
Rag	23.0	58	49	170	20.6
Alpha	23.1	85	1280	104	33.9
Mitscherlich	24.2	104	508	91	39.0
Alpha	24.5	93	1823	112	35.1
Rag	25.0	72	89	192	25.0
Alpha	25.0	75	123	90	29.7
Rag	27.0	62	53	170	21.2
Alpha	34.1	100	2149	125	33.8
Rag	94.0	72	132	237	21.8
Alpha	110	75	98	200	25.5
Rag	123.0	70	133	23.2	23.0
Rag	200.0	83	285	272	25.1
Rag	208.0	77	129	270	26.2
Rag	210.0	87	375	282	26.0
Rag	300.0	90	385	300	27.0

TABLE 31

Relation Between Alpha-Cellulose and Strength of the Three Standard Pulps Regardless of Method of Degradation

Pulp.	Alpha-Cellulose	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Alpha	77.2	34.4	3	33	17.4
Mitscherlich	77.8	36.0	6	30	18.7
Mitscherlich	78.4	72.3	65	43	26.5
Mitscherlich	78.5	67.5	165	59	27.5
Mitscherlich	79.3	80.7	382	53	30.0
Mitscherlich	79.4	81.0	220	54	29.5
Mitscherlich	80.7	92.0	450	66	34.0
Mitscherlich	82.7	104.0	508	91	39.0
Alpha	83.5	67.0	62	62	28.2
Alpha	85.6	75.0	230	82	28.2
Alpha	86.0	56.0	40	58	25.7
Alpha	86.6	78.0	249	100	31.8
Alpha	87.1	86.0	1075	98	30.9
Alpha	87.7	75.0	178	90	29.7
Alpha	88.4	85.2	1280	104	33.9
Alpha	89.0	93.0	1825	112	35.1
Alpha	89.2	100.0	2149	125	33.8
Rag	91.7	58	49	170	20.6
Rag	93.5	72	89	192	25.0
Rag	94.5	62	53	170	20.6
Rag	95.0	70	133	232	23.0
Rag	95.6	72	132	237	21.8
Rag	95.7	87	375	282	26.0
Rag	96.2	83	285	272	25.1
Rag	96.5	90	385	300	27.0
Rag	96.9	77	129	270	26.2
Rag	97.2	75	98	200	25.5

other words, given a certain pulp of known viscosity, we are not justified in anticipating its physical strength.

13. Considering alpha-cellulose content and copper number values in the same light as mentioned in paragraph 12

above, similar conclusions must be drawn regarding these values.

14. There appears to be little or no correlation between the physical and chemical properties of representative commercial bleached sulfite pulps.

15. It would appear that any relation between physical quality and chemical constants is specific and relative in nature, and dependent upon the elements of time, temperature and concentration.

16. Under the conditions studied it would appear that a hydrolyzing action due to acids causes least alteration of physical strength, oxidation and hydrolyzing action of bleach liquor causes greater loss in physical strength than does acid, whereas heat degradation, possibly due to dehydration and subsequent rupture of the cellulose micelle, results in marked and greater alteration of strength. One might further elaborate by stating that at a given temperature, increasing concentration of free sulfur dioxide, or sulfuric acid in the digester will cause slight, if any, increase in degradation of the cellulose. Bleach plant operations are somewhat more sensitive than digester operation on a given sulfite cellulose. Heat, or the drying operation, on the other hand, markedly affects pulp strength quality. Any alteration in procedure immediately reflects itself by increase or decrease in physical strength of the pulp.

CHAPTER VI

Conclusions

In drawing conclusions one must emphasize the complex conditions under which a study of this type must necessarily be conducted. First of all, we are dealing with three representative types of pulp which are decidedly different in certain respects. It has been the aim to reduce these pulps to a definite status as measured by one yard stick, the cuprammonium viscosity test. One is therefore forced to disregard any potential effect other constituents might exert upon the strength properties of the degraded pulps. Secondly, the method of degradation of the pulps would in some respects, especially as to time, temperature and concentration of degrading agent, affect the results. Thirdly, the method of beating for the rag stock is different from that of the Alpha and Mitscherlich pulps.

It is quite apparent that the entire system is a complex one, and therefore, to a certain extent at least precludes the possibility of obtaining a wealth of definite logical conclusions. The inherent complex constituents other than cellulose in the various pulps react in a manner difficult to follow by means of the various physical and chemical methods available.

The hydrolyzing action of the dilute sulfuric acid may react in one way on the constituents other than cellulose and in another on the cellulose itself. A conception of the exact action of heat on cellulose and its constituents is quite theoretical. We assume that the heat first liberates bound water, absorbed or imbibed, and subsequently causes a dehydration of the cellulose micelle which may or may not result in depolymerization and subsequent loss in physical strength. Since the pulps are purified to some extent previous to degradation, we assume the action of the bleach liquor to be one of oxidation and hydrolysis, in which the cellulose is attacked directly.

The ramifications of this problem are so vast and extensive that one can hardly hope to establish all tendencies of facts. In general, certain tendencies have been noted and possibly a few definite conclusions have resulted from this study.

1. Degradation of various types of pulps by different degrading agencies can be followed by means of the cuprammonium viscosity test.

PACIFIC PULP & PAPER INDUSTRY

2. Changes in cuprammonium viscosity is invariably accompanied by a decided alteration in physical and chemical properties of pulps in general.

3. Under similar condition of preparation or treatment there seems to be a definite relation between viscosity and the fold quality of various types of pulps.

4. Any relation between physical and chemical properties of various types of pulps on the one hand, and methods of degradation, or degrading agents, on the other, is specific and relative in nature. In other words, any statement as to correlation between physical and chemical properties and degrading influences must be amplified by a description of the given type of pulp, the specific degrading agent, and conditions of degradation, such as time, temperature and concentration.

5. Under the conditions of time, temperature and concentration, and consistency studied, it would appear that of the three degrading agents chosen, acid causes least alteration of physical and chemical qualities of cellulose, bleach next, and heat the greatest change in the given qualities.

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TABLE 32
Relation Between Copper Number and Strength of the Three Standard Pulps
Regardless of Method of Degradation

Pulp.	Copper Number	Max. Mullen	Max. Fold	Tear at Max. Mullen	Max. Tensile
Rag	.105	90	385	300	27.0
Rag	.105	83	285	270	26.2
Rag	.121	87	375	282	26.0
Rag	.137	77	129	270	26.2
Rag	.148	75	98	200	25.5
Rag	.158	72	132	237	21.8
Rag	.211	62	53	170	21.2
Rag	.317	70	133	232	23.0
Rag	.423	72	89	192	25.0
Rag	.624	58	49	170	20.6
Alpha	.97	100	2149	125	33.8
Alpha	1.04	93	1825	112	35.1
Alpha	1.09	85	1280	104	33.9
Alpha	1.16	75	178	90	29.7
Alpha	1.21	86	1075	98	30.9
Alpha	1.24	75	230	82	28.2
Alpha	1.40	78	249	100	31.8
Alpha	1.66	56	4058	58	25.7
Alpha	1.71	67	62	62	28.2
Alpha	2.25	34	3	33	17.4
Mitscherlich	2.72	104	508	91	39.0
Mitscherlich	2.77	92	450	66	34.0
Mitscherlich	2.84	81	220	54	29.5
Mitscherlich	2.90	80	382	53	30.0
Mitscherlich	2.96	67	165	59	27.6
Mitscherlich	2.98	72	65	43	26.5
Mitscherlich	3.11	36	6	30	18.7

TABLE 33
Relation Between Physical and Chemical Properties of a Few Representative American and Foreign Bleached Sulphite Pulps

Pulp No.	Max. Mullen	Tear at Max. Mullen	Fold at Max. Mullen	Alpha Cellulose	Viscosity	Copper Number
1	78	120	100	82.1	10.0	4.82
Alpha	87	240	500	89.7	29.3	2.18
3	90	150	450	86.7	13.9	3.16
4	93	230	750	86.8	24.5	2.72
5	93	270	350	89.2	22.2	2.54
6	94	230	950	85.6	18.8	2.84
Alpha	97	300	1450	94.8	66.9	.86
8	99	200	1800	85.8		3.17
Alpha	100	230	850	92.8	54.0	.80
10	101	240	1200	90.4	20.5	2.60
11	103	230	2000	87.3		1.71
12	103	230	2550	85.4	40.4	2.23
13	105	240	800	89.9	16.0	2.29
14	105	270	3100	89.2	36.6	1.95
15	107	200	1050	89.8	18.6	1.24
16	107	190	1700	89.2	30.1	1.07
17	108	140	750	81.3		4.20
18	109	290	2500	89.0	45.0	1.90
19	112	170	1700	87.9	18.9	2.61
20	119	270	5600	86.0	24.2	2.43

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LOS ANGELES PERSONALS

Ted Falk of L. A. Paper Bag Co. made a fast trip to New York and return last month, to visit Southern Kraft and the Potdevin Machine Co. He flew both ways and got back to Los Angeles November 17th after a rough air trip on the westward flight.

W. B. Reynolds, secretary of the various Southern California paper trade groups, will be seen in the Bay district between Christmas and New Year's, as usual. He plans to spend the holidays with relatives and friends in and around San Francisco.

Sam Abrams of the U. S. Paper Co. left Dec. 4 for a month's trip through the East. Fred French of the Fred H. French Paper Co. continued his heavy traveling program for 1935 by spending a good part of November in Chicago.

Zeke Carpenter of the Carpenter Paper Co. was here from Omaha the first week of December for a short visit. Paul Butler, whose arrival on the Coast was reported in these columns last month, is spending a winter vacation at Santa Barbara. He drove west with a luxurious trailer attached to his car, in which may be found all the modern home conveniences.

J. Arthur Kelly, who resigned as manager of the General Paper Co. last month, expects to start in business for himself shortly after the first of the year, as the Kelly Paper Co. His location will be on South Los Angeles St., near 10th.

G. Dewey Megel, Los Angeles manager for Hawley Pulp & Paper Co., returned from Oregon City the middle of November, after a sales meeting of all coast managers, at which this year's business and the 1936 program were discussed. Ira F. Doud was also there from San Francisco, as was Lloyd Riches of Portland and Fred G. Stratham of Seattle.

Ross Devean has left the U. S. Paper Co., where he was assistant general manager, and is now with the General Paper Co. here as manager of the coarse paper department. Irvin Spivak, who formerly was with Zellerbach and more recently with the Elkus Paper Co., in San Francisco, has joined the U. S. Paper Co. organization.

Robert C. Clark, who was general sales manager for the Zellerbach Paper Co.'s Los Angeles division, has gone to Kansas City to assist Ralph Lane, in the opening of the Zellerbach division there, following the purchase of the Lane Paper Co. by the western concern.

Philo K. Holland, Zellerbach operating manager in Los Angeles, has been made assistant manager of this division, and Graham Whitehurst, who was operating manager at Portland, has been brought down as operating and personnel manager. L. T. Bleasdale, former personnel manager here, has been made manager of the purchasing department.

The new structure for the Zellerbach Paper Co. is rapidly nearing completion, and the company expects to occupy the new quarters and be ready for business on January 2.

Chester O. Gunther, salesman on coarse paper and bags for the Crown-Willamette Paper Co., returned to Los Angeles December 9, after a two weeks vacation trip to visit his mother in Portland. Lester Remmers was busy as a bird dog holding down the fort while he was gone.

FINE PAPER MEN ORGANIZE

The fine paper distributors of Southern California have grouped themselves together again under a new organization called the "Printing Paper Conference of Southern California." As a result of the reorganization, market conditions are more harmonious and the situation has already improved. W. B. Reynolds is, of course, secretary of the group.

O'KEEFE MARRIED IN DETROIT

Tom O'Keefe of the Sierra Paper Co. and the Pacific Coast Paper Co., was married at Detroit on Thanksgiving Day to Miss Helen Geyman. He and his new bride drove a new car west, arriving in Los Angeles about Dec. 10. As manager in both San Francisco and Los Angeles, Mr. O'Keefe will establish residences in both cities, and continue to divide his time between the two.

LOS ANGELES PAPER BOX INSTITUTE MEETS

Members of the Paper Box Institute of Los Angeles, their guests and representatives of the printing trade held a very enjoyable golf tournament December 5 at the beautiful and exclusive Bel Air Country Club near Santa Monica. There were about 10 foursomes in the meet.

The group meets every two weeks now, following a reorganization. The annual outing is planned for Dec. 19-20 at the La Serena Country Club, and the box makers are looking forward with anticipation to the program of golf, entertainment, awarding of prizes, etc. There will be golf in the afternoon, a banquet in the evening, and after staying all night at the club, they will tee off on the second day's tournament.

L. A. PAPER MILL MEN MEET

The Paper Mill Men's Club met November 22 in Los Angeles for the semi-monthly dinner at the Stevens Nikabob restaurant, and chalked up another red-letter day in the successful history of the organization. Russel Attridge, Charles L. Brouse and Frank N. Gladden did the committee work that resulted in an A-1 evening for all concerned.

Association business conducted consisted chiefly of the demolition of a large number of thick steaks, which several paper men declared were "the best since I left Chicago."

The December business meeting will be held at noon on December 19, and probably will again be at the Transportation Club. Harry Fields of National Paper Products is chairman for that event, assisted by Warren E. Brooks of the Great Northern Paper Mills and Kenneth Ross of the Hawley Pulp & Paper Co.

ZELLERBACH'S NEW ADVERTISING CAMPAIGN UNDER WAY

The Zellerbach Paper Company's "Stars of Today" advertising program opened up in November with a striking mailing piece in black and green entitled "Glamorous." The thought expressed is that printing can be glamorous, and the "star points" emphasized were broadsides, illustrated letters, package inserts and booklets, all of which Zellerbach point out, can be made glamorous by the application of good art work, fine paper and fine printing.

ELKUS PAPER COMPANY MOVES

The Elkus Paper Company of San Francisco moved late in November to their new building at 1208 Howard Street.

The new quarters are larger, permitting the carrying of a larger stock and the furnishing of better service to customers.

Richard J. Elkus and Eugene S. Elkus, Jr., head of the company, which distributes wrapping paper, boxes, tissues, glassine, waxed paper, twine, sealing tape, corrugated paper and cartons, cups, plates, toilet paper, towels and janitor supplies.

CLARK TRANSFERRED

R. C. (Budge) Clark, formerly sales manager of the Los Angeles division of Zellerbach Paper Co., has been transferred to the firm's new Kansas City branch, which has moved to new and larger quarters at 1601 Gentry Street, North Kansas City. This formerly was the Lane Paper Co. and Ralph Lane is manager.

Philo Holland, formerly operating manager for Zellerbach at Los Angeles, has been made assistant to Mason Olmsted, division manager. Graham Whitehurst, operating manager at Portland, has been transferred to Los Angeles to serve in the same capacity.

ZELLERBACH HOLDS DIVISIONAL SALES CONFERENCE

Four executives from the headquarters office of the Zellerbach Paper Co., San Francisco, were on a trip through the Pacific Northwest in November and December conducting sales conferences at Portland, Spokane and Seattle.

These four were: Victor E. Hecht, vice-president in charge of printing paper sales; Thomas J. Finerty, general manager of the wrapping paper department; D. C. McMillin, in charge of stationery, and Sidney L. Lee, headquarters cellophane specialist.

This business of traveling contingent of executives is something new for the Zellerbach folks, for in the past they have had the manager and sales manager of each division visit San Francisco semi-annually for a general meeting. It is the belief that much good can be accomplished by first-hand contact with the men on the firing line right in their own home towns.

PACIFIC PULP & PAPER INDUSTRY

MCCORMICK MARRIED

Wm. McCormick, assistant purchasing agent for Fibreboard Products, Inc., at their Vernon plant, was recently married in South Pasadena, and is now back at his desk after a brief honeymoon.

FIBREBOARD (VERNON) NOTES

It was almost "old home week" at the Fibreboard plant in Los Angeles recently, when a galaxy of stars visited the mill at Vernon. Among those there were Ed Farina, W. H. Thomas, T. N. Bland, Reynold McHenry, Isidore Zellerbach, J. Y. Baruh, and several others.

Allied tradesmen made the mill a port of call numerous times in the last month, including W. H. Williamson of Shuler & Benninghofer, Bill Marshall of Heller & Merz, Portland, George Meddis of Simonds, Worden & White, accompanied by their president, Mr. Simonds of Dayton, O., Ralph Waldo of National-Aniline & Chemical Co., San Francisco, and Alec Duncan of Paper Makers Chemical Corp., Portland.

Frank Engelke, assistant superintendent of the Paraffine Co. plant at Emeryville, made a brief visit to inspect the new deinking plant.

DILL DIES

Ernest James Dill, for more than 20 years a member of the Fibreboard staff, and lately manager of the Independent Paper Stock Co., a Fibreboard subsidiary, died a few days before Thanksgiving. His death came on his forty-fifth birthday.

WHEELWRIGHT VISITS COAST

Mr. George W. Wheelwright of the third generation of paper makers bearing that name, vice president of Wheelwright Paper Company, Leominster, Mass., arrived on the Pacific Coast November 11.

He called on the trade from Seattle to San Diego and all intermediate points, where he is well known among the paper merchants. Manufacturers of mill bristles, index and blanks, the Wheelwright Paper Company is a subsidiary of the Mead Corporation of Dayton and Chillicothe, Ohio. The latter company has book paper mills at Chillicothe, Ohio, Kingsport, Tenn., Gross, Mich., and board mills in Tennessee, Virginia and New Jersey, having one of the most up-to-date laboratory and technical staffs in the industry. The Mead Corporation has made many improvements at the Wheelwright mill, which Mr. Wheelwright says greatly increased business, due to higher standards and quality now being maintained. He reports his mill as being busier now than for a number of years.

Accompanying Mr. Wheelwright was Andrew H. Cochran, Pacific Coast representative of Wheelwright Paper Company, who also represents Dill & Collins, Inc., of Philadelphia, another affiliate of Mead Corporation. The combined offices of Mead Corporation, Wheelwright Paper Company and Dill & Collins, Inc., are under direction of Mr. Cochran at 444 Market Street, San Francisco. Mr. Cochran has just returned from the East, where he attended a sales conference at Dill & Collins, Inc., in Philadelphia and visited the Wheelwright Paper Company mill in Massachusetts, as well as the Mead Corporation offices in New York City and Chicago. Very marked optimism among the eastern manufacturers was noted by Mr. Cochran.

S. W. Blanchard, who left the Coast in July, is mill manager of the Wheelwright company.

GENERAL PAPER CHANGES

General Paper Co., San Francisco, announces it is now the Northern California exclusive representative of the Royal Card and Paper Co., New York, for its complete announcement line and also for blendstone blanks and placard stock of the Beveridge Paper Co., Indianapolis, Ind. General also has taken on the cheviot bristles and specialties of the Hawley Pulp and Paper Co.

J. Arthur Kelly has resigned as division manager for General Paper Co. in Los Angeles. General is moving its Los Angeles headquarters to larger quarters to take on new stock and care for growing expansion.

ZELLERBACH SERVICE PINS

Recent recipients of 20-year service pins from the Zellerbach Paper Co. are: O. C. Sayles, Portland, wrapping paper sales manager.

Louis Oliver, San Francisco, head of the envelope and announcement department.

Leo Schoenfeld, San Francisco, city salesman.

ZELLERBACH RENO BRANCH BURNS

Reno branch of Zellerbach Paper Co. recently was destroyed by fire. Charles Gimblett is manager there. The company did not own the building.



FIBREBOARD'S LOS ANGELES STORE

The above photograph was recently taken of the complete and modern grocery store installed in the Los Angeles offices of Fibreboard Products, Inc.

Purpose of the display is to help packers and merchants visualize how their goods packed in Fibreboard containers of various types will appear when displayed in a grocery store alongside of other products.

The Los Angeles store, in charge of T. F. Barnes, is complete with a stock of groceries worth several thousand dollars and fixtures including cash registers, scales and refrigerators.

A similar store, installed in the San Francisco office some time ago has proved a valuable sales builder.

MARKED INDUSTRIAL ACTIVITY IN SWEDEN

The business situation in Sweden during the third quarter of the year was so highly favorable that in many lines conditions approached "boom" levels, according to a report to the Commerce Department from its commercial attache at Stockholm.

During the period industrial activity continued at a high rate, particularly in the groups supplying the domestic market. Employment in the stone working, foodstuffs, textile, leather and rubber plants and the building trade increased steadily during the quarter. The iron and steel market, which declined slightly in June, showed increased activity during the beginning of the third quarter, although a seasonal drop was visible in the late summer. Iron ore exports attained a larger volume in July and August than during any previous months of the year. The domestic market for iron and steel is still reported to be quite satisfactory indicated by increased imports and domestic production, it was stated.

Continued doubt as to the Russian timber position in the British markets reached in a slowing down of timber shipments; sales at the end of the quarter totaled 675,000 standards compared with 825,000 at the end of the same quarter in 1934. The export of chemical pulp has gone forward on a record scale. Nearly the entire estimated 1935 production of sulphate pulp and more than 90 percent of the sulphite pulp has been sold. Exports of paper during the quarter were more than 11 percent above the same period of 1934, according to the report.

Car loadings during July and August were 6 percent greater than for the corresponding months of 1934 and laid-up tonnage decreased noticeably. Unemployment in the trade unions reached a lower level than during any time since 1930 and the total number of registered unemployment at the end of August was less than 1 percent of the total population.

The only cloud on the Swedish economic horizon is the possibility of a labor conflict in January, the report states. Protesting against higher living costs, on September 30, over 100,000 workers in the machinery, iron and steel, building and other industries canceled their wage contracts effective January 1, 1936. Failure to negotiate new contracts in the near future may affect Swedish economic conditions unfavorably.

PAPER IMPORT COMMITTEE REPORTS

Since the disclosure by the import committee of the American paper industry of the attempt of importers to cause a flat reduction of 20 percent in existing tariff rates by claiming for the products of other nations the preferential treatment given Cuban products, the number of individual cases involving this claim has risen to over 2,200. When the first announcement was made of this situation there had been less than 900 cases initiated.

Among the cases involving paper are the following new protests, all claiming a 20 percent reduction from the normal rate:

- Drawing paper from Germany.
- Greaseproof paper from Germany.
- Marbleized paper from Germany.
- Metal decorated paper from Germany (two shipments).
- Pulpboard from Sweden.
- "Paper", not further described, from Germany (two shipments).
- Carbonizing tissue from Italy.
- Tea wrappers from China.
- Photographic tissue (rotogravure) from England.
- Baryta coated paper from Germany.
- Baryta board from Germany.
- Pulpboard from Finland.

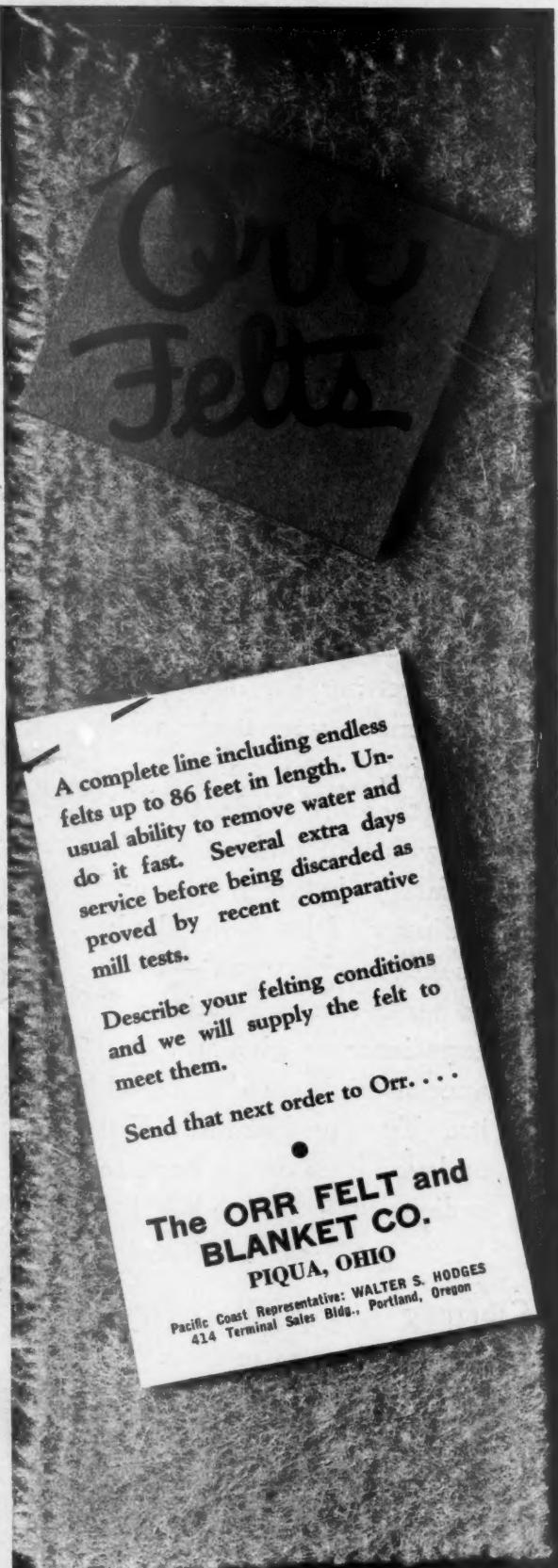
The import committee, by reason of its intensive study of foreign trade, was the first to call attention to this peril. All America industry is now aroused and these cases are causing the greatest furor in the history of the United States customs courts.

NEW IMPROVEMENTS IN FRANCKE FLEXIBLE COUPLINGS

New and important changes in the design and materials of the Francke Flexible Coupling are announced by the John Waldron Corporation, New Brunswick, New Jersey. The improvements have been made to meet the changed operating conditions which have occurred in the field of mechanical power transmission within the past few years.

All Francke Coupling flanges, except the larger sizes, are now being made of a forged high manganese alloy steel. The larger sizes are molded of high grade semi-steel.

In order to prolong the life of the moving parts of the



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coupling, self-lubricating, wax impregnated bronze bushings now replace the old style dry bushings. The new bushings have highly polished bearing surfaces which provide a large contact area. Due to their self-lubricating feature, little resistance is offered to the end-wise movement of the shafts of the connected machines when under load.

Another important improvement is in the design of the cross pins by which the crucible spring steel laminations are held within the keepers. The center portion of the cross pins which passes through the perforation in the laminations is now made glass hard. By a special process, the ends of the cross pins are expanded into the tapered recesses of the keepers, thereby making it impossible for them to become loose.

With these and other improvements, it is claimed by the manufacturer that the Francke is now as trouble-free as it is possible to build a flexible coupling.

Detailed information upon the improvements in the Francke Flexible Coupling is contained in a new catalog just off the press, copy of which will be sent upon request.

OCTOBER NEWSPRINT STATISTICS

Production in Canada during October, 1935, amounted to 266,515 tons and shipments to 266,679 tons, according to the Newsprint Service Bureau. Production in the United States was 79,746 tons and shipments 81,817 tons, making a total United States and Canadian newsprint production of 346,261 tons and shipments of 348,496 tons. During October 29,744 tons of newsprint were made in Newfoundland and 1,942 tons in Mexico, so that the total North American production for the month amounted to 377,947 tons. Total production in October, 1934, was 342,857 tons.

The Canadian mills produced 126,824 tons more in the first ten months of 1935 than in the first ten months of 1934, which was an increase of 6 per cent. The output in the United States was 43,621 tons or 5 per cent less than for the first ten months of 1934, in Newfoundland 17,308 tons or 7 per cent more, and in Mexico 616 tons more, making a total increase of 101,127 tons, or three and two tenths per cent.

Stocks of newsprint paper at Canadian mills were reported at 73,579 tons at the end of October and at United States mills 14,379 tons, making a combined total of 87,958 tons compared with 90,193 tons on September 30, 1935.

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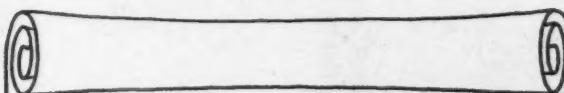
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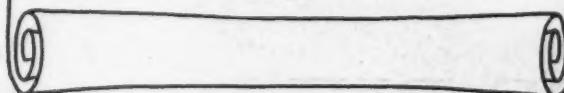
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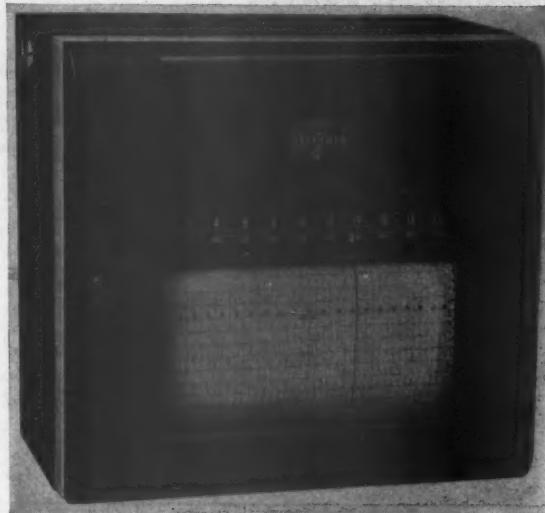
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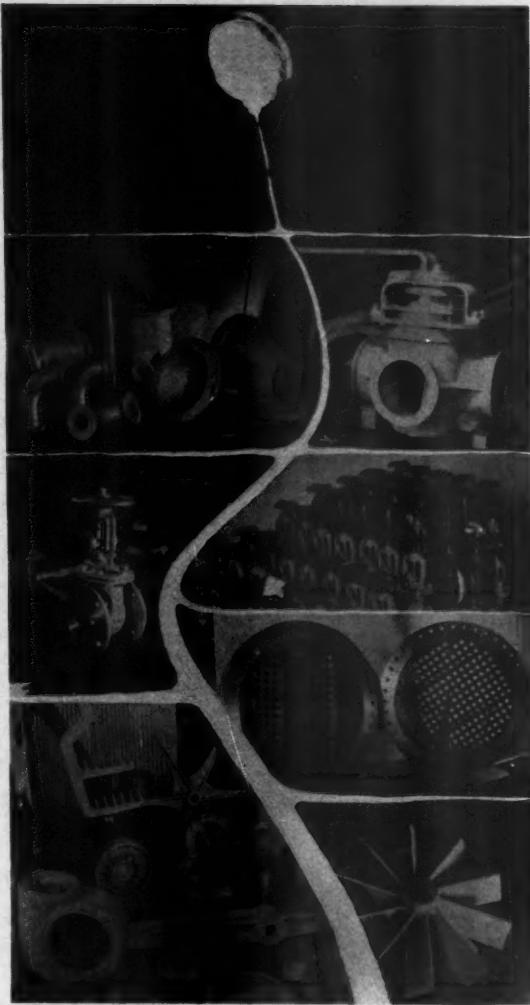
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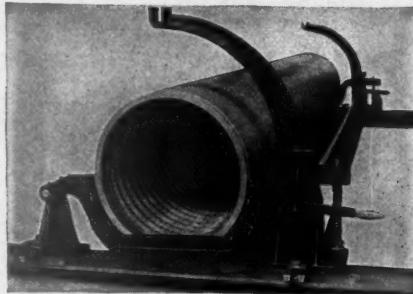
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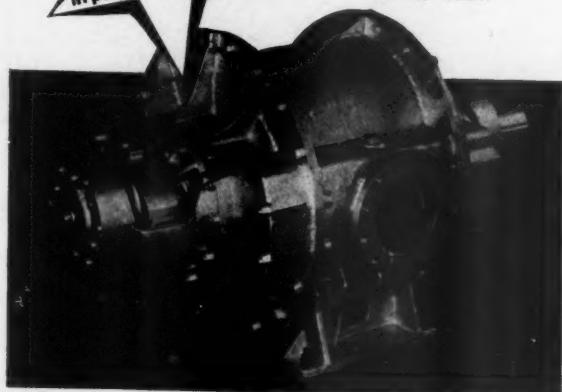
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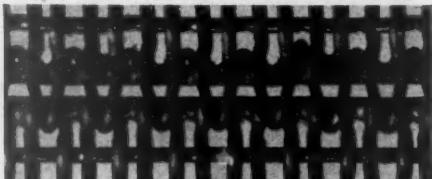
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CONTENTS

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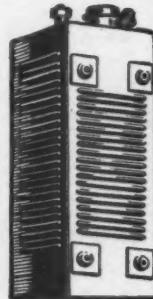
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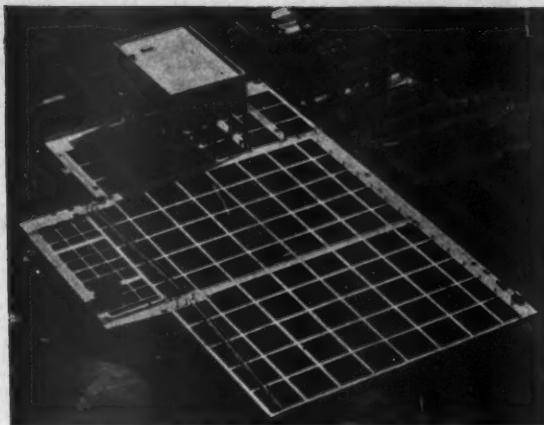
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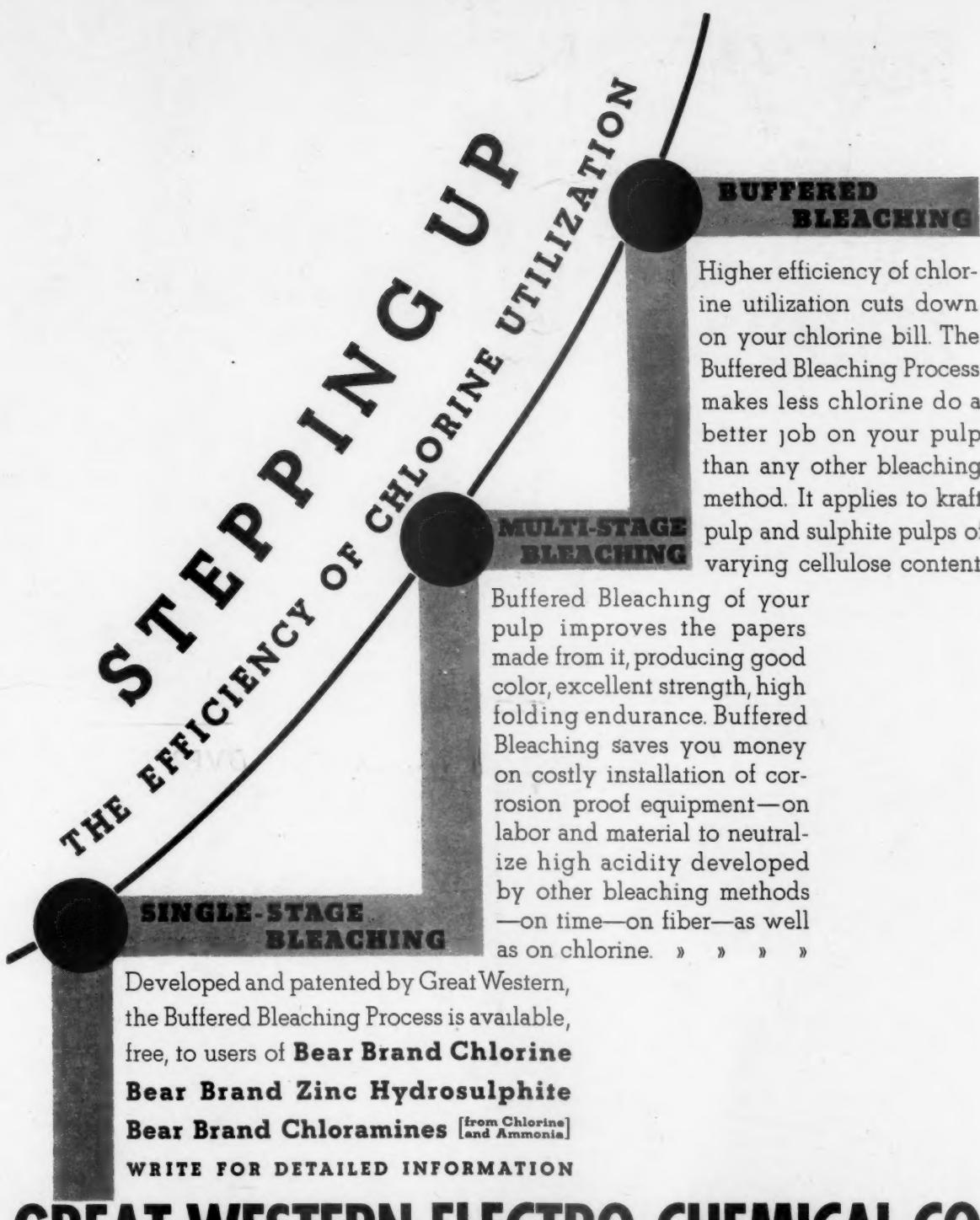
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INDEX OF ADVERTISERS

A	K
Appleton Wire Works, Inc. 34	Kuppler's Sons, Chris. 39
Appleton Woolen Mills 39	
B	L
Bristol Co., The 34	Lindsay Wire Weaving Co. 38
Brubaker Aerial Surveys 39	Link-Belt Co.—Outside Back Cover
C	Lockport Felt Co. 34
California Cotton Mills 36	
Cameron Machine Co. 38	N
Chemipul Process, Inc. 39	National Aniline & Chemical Co. 32
Chrome Plating Co., Inc. 38	National Tank & Pipe Co. 40
Chromium Corp. of America 39	O
D	Orr Felt & Blanket Co. 29
DeGuere, L. A. 39	P
Draper Bros. Co. 37	Pacific Coast Supply Co. 33
Duriron Co. 33	Paper Makers' Directory of All Nations 37
E	Puget Sound Power & Light Co. 30
Eastwood-Neeley Corp. 37	R
Edison Storage Battery Co. 38	Ross Engineering Corp., J. O. 39
Electric Steel Foundry Co. 39	S
Ferguson & Co., Hardy S. 40	Schoenwerk, O. C. 40
Freeport Sulphur Co. 36	Scientific Supplies Co. 18
G	Shibley Co. 40
General Electric Co. 36	Shuler & Benninghofen 30
Great Western Electro-Chemical Co. Inside Back Cover	Simonds Worde White Co. 35
H	Selden, Stanley 39
Hardy, Geo. F. 40	Stebbins Engineering & Mfg. Co. 39
Heller & Mertz Corp. 35	T
Hodges, Walter S. 37	Taylor Instrument Co. 1
Hotel Claremont 38	Texas Gulf Sulphur Co. 31
Huntington Rubber Mills, Inc. 36	U
Huyck & Sons Co., F. C. 31	Union Screen Plate Co. 38
I	W
Improved Paper Machinery Corp. 39	Waterbury & Sons Co., H. 38
	Western Gear Works 38
	Weyerhaeuser Timber Co. Inside Front Cover



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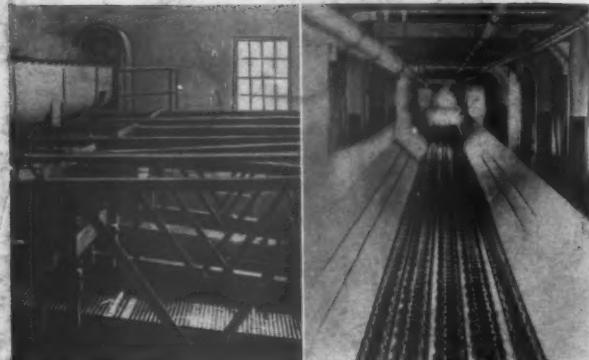
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EFFICIENT HANDLING



Steel encased bucket elevator handling chips

AT



Screening the chips, screw conveyor over-head

Five-strand chain conveyor to ground wood mill

Spruce Falls Power & Paper Company

THE newsprint mill and sulphite pulp mill at Kepuskasing in northern Ontario, owned by The New York Times Company and the Kimberly-Clark Corporation, is one of the largest and most modern pulp and paper mills on the Continent. It has a liberal amount of Link-Belt elevating and conveying equipment, including Link-Belt belt conveyors and belt conveyor tripper; power shovel, chain conveyors; screw conveyor; bucket elevators and a traveling water intake screen.

Each conveying unit used in this installation was selected as the best device made for the service it was to perform.

Link-Belt makes a conveying and positive drive unit for every service; and with our long experience in paper mill work, our engineers are prepared to solve your particular problem to your entire satisfaction.

LINK-BELT COMPANY

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Link-Belt belt conveyor and belt tripper handling chips

Double-strand chain conveyor



LINK-BELT
CONVEYORS and DRIVES



